United States Marine Corps
MAGTF Staff Training Program
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Quantico, VA 22134-5001

C2PC

Tutorial Manual for Staff Officers

"Training The First To Fight"

I. General Description

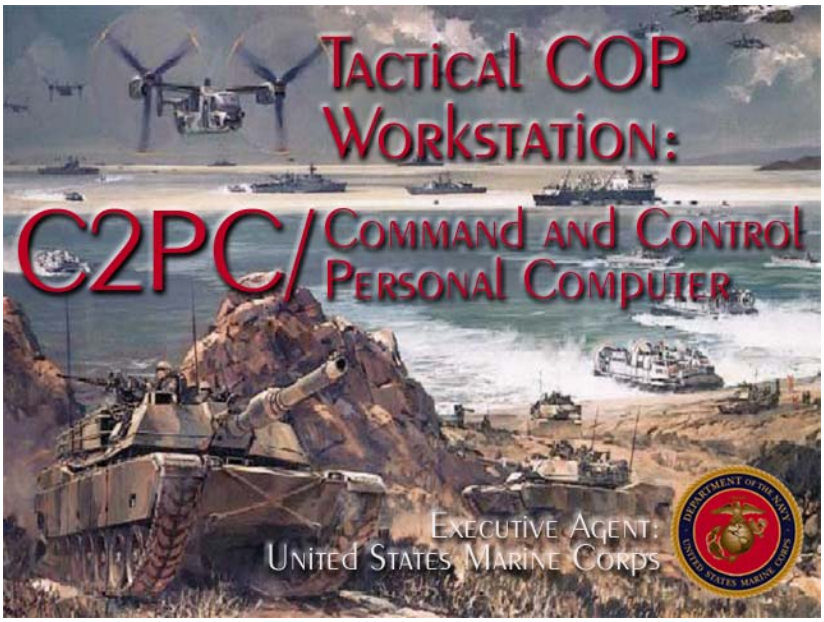


Figure 1. C2PC Splash Screen

Command & Control PC is a Windows-based software application designed to facilitate military command and control functions. Used as a stand-alone tool, you can produce overlays and operational. When connected to a computer network, in other words, as a client to a GCCS or IOS, C2PC has the capability of depicting the current locations of the friendly and enemy units that have been inputted into a tactical database, as well as instantly share overlays and message traffic. With this electronic connectivity, C2PC becomes a powerful tool for the commander by providing a Common Tactical Picture throughout his command

A. What is C2PC?

Command and Control PC (C2PC) is a client application that displays tactical track data from a UNIX-based Tactical Database Manager (TDBM) data server (Global Command and Control Server [GCCS] or Intelligence Operation Server [IOS]). C2PC includes the following features:

- Simultaneous display of multiple independent map windows. Each map window can display a different area of interest using different digital map and various filtered views of the track database.
- Supports a variety of digital map data, including the NIMA ADRG, RPF: CADRG, CIB; VPF: DNC, VMAP, WVS, DTOP; DTED; NITF; WBD I & II; the NOAA BSB and Vector Shoreline; GeoTiff, ETOP, and SHAPE.
- Supports numerous mapping datum.

- Mapping features include political boundaries, rivers, and roads.
- Configuration management for units of measure and accuracy. Each C2PC can be individually tailored.
- Full Common Operational Picture track database add, edit, and delete capabilities; and manual or auto declutter of such tracks.
- Numerous plot options to determine how tracks are displayed in the map windows. Tracks can be filtered or toggled on/off according to threat status, track category, echelon level, track type, and time-late status.
- A full overlay editor, including export/import capabilities:
    - C2PC - C2PC
    - C2PC - TDBM hosts.
- Fully supports MIL-STD-2525B or NTDS symbology for track display and overlays.
- An extensive routes database and editor.
- Transmits and receives JVMF messages.
- A full set of Tactical Decision Aids (TDAs), including a range, bearing and datum conversion tool.
- A tactical unit/target database and editor.
- Object Linking and Embedding (OLE) capability. A numerous of objects can be embedded into C2PC overlays (MS Words documents and MS PowerPoint slides and picture among others) in support of overlays.
- C2PC maps (what is seen on screen including overlays, tracks, etc) can be embedded in other applications like MS PowerPoint by the save as bitmap feature.

II. Getting Started

In this chapter a briefly description of the C2PC Graphic User's Interface (GUI) or C2PC Main Window will be provided.

A. The C2PC Window

The C2PC main window (Figure 2) displays every time you start C2PC. It gives you access to the C2PC tools and features.
The C2PC window consists of:

- Title bar
- Menu bar
- Toolbars
- Map window
- Tracks, Overlays, Routes, Units, or Formations List (when displayed on the map)
- Status bar

C2PC layout is like most window applications. You have the normal **Toolbar** buttons/icons and **Pull Down Menus** in which you will find some extra features and functionalities as well as the ones found in the different toolbars.

1. Title bar

The title bar displays the datum used for the map, followed by the map name and type.

NOTE: The Title bar contains the name of the program (C2PC), the datum currently loaded and the name of the active map.

2. Menu bar

The menu bar displays a set of menu names. Click a name to display a menu of related options

NOTE: When an injector is selected, the menus on the main menu bar will change according to the chosen injector.

3. Toolbars

There are three main toolbars that can be displayed in the default C2PC window: the **Standard**, **Moving**, and **Snap-In** toolbars. They can be toggled on or off with the **Map: Toolbars** option.

a. Standard Toolbar

The **Standard** toolbar (Figure 3) contains the **New Map**, **Print**, **Whole World**, **Map Favorites**, **Zoom In**, **Zoom Out**, **Zoom Box**, **Recenter**, **Map Pan**, **3D View**, **Cancel Redraw**, **Refresh Map**, **Auto Declutter**, **Manual Declutter**, **Toggle Coverages Grid**, **Map Colors**, **Dim Map**, **Brighten Map**, **Range Bearing**, **Range**, and **Search Help** icons.

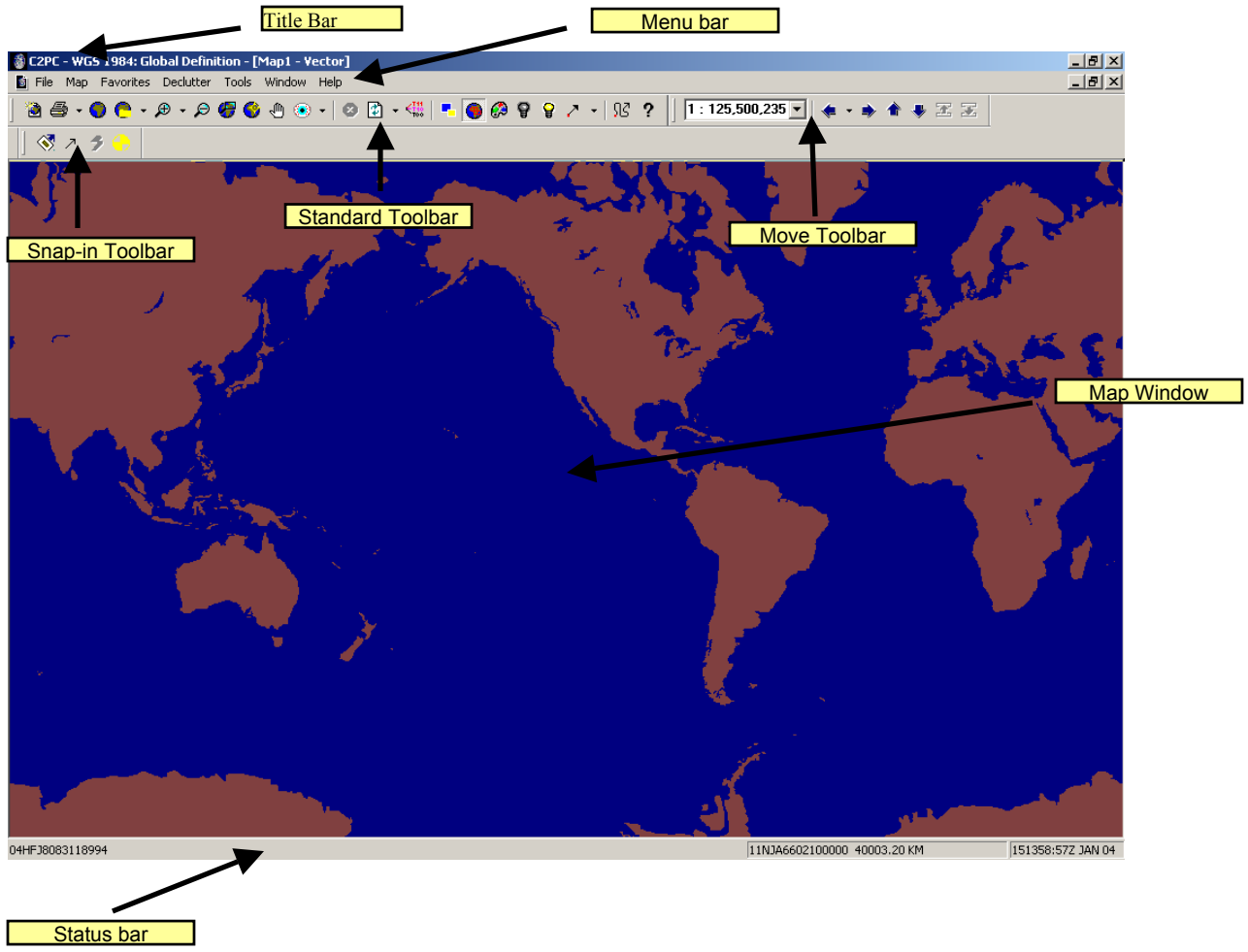


Figure 2. Main Window

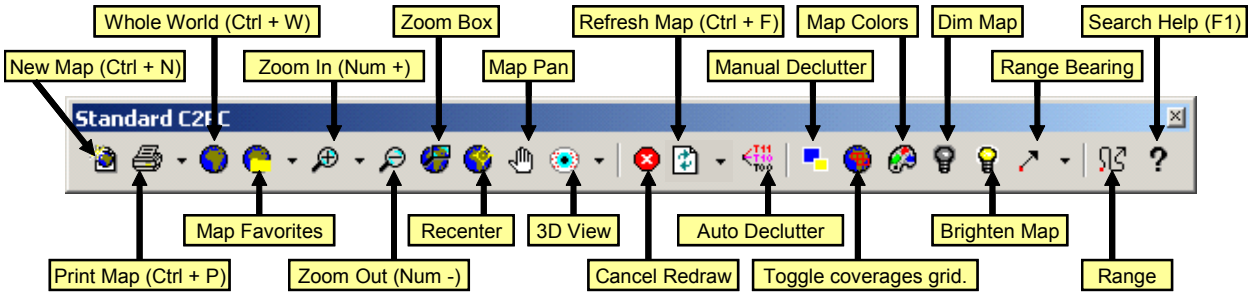


Figure 3. Standard Toolbar

Use these icons for quick access to functions/features. The majority of this icons are self-explanatory. Some of the functionalities accessible through the icons are available in the

menu bars. The **Dim Map** and **Brighten Map** buttons decrease or increase the map intensity in small increments.
The **Map Pan** button pans the map in any direction. Click the **Map Pan** button to change the pointer to a hand symbol, then click and drag the map to pan the map view in any direction. The **Map Pan** hand symbol remains selected until the **Map Pan** button is clicked again. Click the right mouse button on the **Map Pan** button to choose a **Map Pan** the value of the size of the window you want move (Figure 4). If you choose 0, the **Map Pan** option is deactivated. If you choose 1/8, you may pan to 1/8 the size of the window in any direction. Choosing 1/4 allows panning to 1/4 of the window size, and choosing 1/2 allows panning to 1/2 of the window size.

Figure 4. Map Pan

b. Moving Toolbar

The **Moving** toolbar displays the current scale of the map along with a group of arrow options, and **Next Up** and **Next Down** options.

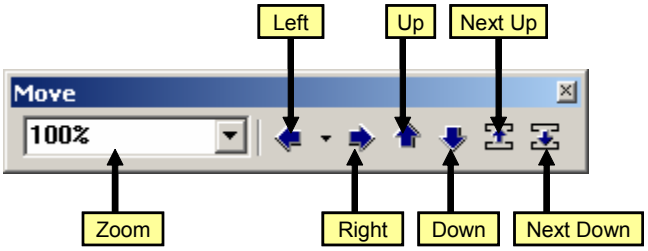


Figure 5. Moving Toolbar

NOTE: The **Next Up** and **Next Down** buttons will be unavailable if no digital maps are loaded into C2PC.

You can change the current viewing scale of the map by using the down arrow button to select a new scale. Available scales range from 1:10K to 1:100M or in percentage.
The **Left**, **Right**, **Up**, and **Down** arrows move your view of the map in those directions. When you click one of the arrows, part or the entire map moves off the screen, and the other side of the map is filled with new map data. As a default setting, 1/4 of the current map moves off the screen. You can change the percentage of the move from 1/4, 1/2, 1, or 2. This can be accomplished by clicking the pull-down arrow on the **Left** arrow button. Loaded digital maps into C2PC are kept by layers, from the highest scale to the lowest.

You can use the **Next Up** and **Next Down** options to view a different map or step down or up to a different layer or map scale. When the next map is displayed, it is shown at its natural scale.

c. Snap-In Toolbar

The **Snap-In** (Figure 6) toolbar only appears if an option containing other toolbar options is loaded into C2PC (e.g., the **Quick Point** option). Click any icon on the **Snap-in** toolbar for quick access to functions that are available from the menus in the menu bar.

If you place the pointer over an icon without clicking the mouse button, the icon name appears in a pop-up window next to it. A short description of the button's function appears in the left corner of the **Status** bar.

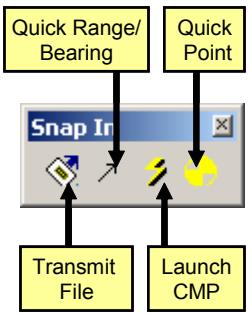


Figure 6. Snap In Toolbar

d. Toolbar Context Menu

There is a context menu associated with toolbars. Click the right mouse button on any toolbar to display the toolbar context menu.

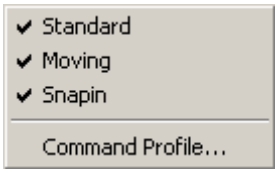


Figure 7. Toolbar Context Menu

The toolbar context menu displays **Standard**, **Moving** and **Snap-in** toggle choices. Click any of these options to toggle the chosen toolbar on/off. If an injector is turned on, a cascading menu appears for that injector with toolbar choices for that injector listed on the cascading menu. Click any of these cascading toolbar choices to toggle those toolbars on/off.

4. Map window

The **Map** window displays a map of the world. The map that appears is the map displayed the last time C2PC was used. **Map** scale options in the menus and toolbar can be used to zoom in or out to any location of interest.
Multiple map windows can be open at one time. Use the **File: New** command, or click the **New Map** button in the toolbar to open additional map windows.

NOTE: Each map displayed in a window can have different plot settings. For example, one map can be set to show all tracks, while another map can be set to display only hostile tracks.
Each map window can display the same or a different map.

5. Tracks, Overlays, Routes, Units, or Formations List

If **Units**, **TrackPlot**, **Routes**, **Overlays**, or **Formations** are toggled on from the ***Tools*** menu (Figure 8), a tree view list appears to the left of the map window (Figure 9). This list shows all objects for the option that are toggled on. For example, if **TrackPlot** is toggled on, this list shows all tracks currently being displayed. If **Tbmd** is installed, there can also be a list displayed for this if **Tbmd** is toggled on from the ***Tools*** menu. There is a tab at the top of the list for the toggle choices. Click on any of these tabs to quickly switch to one of the other choices (Figure 9).

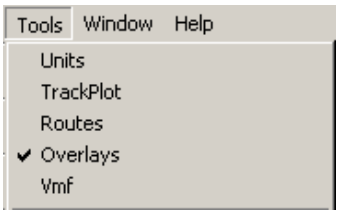


Figure 8. Tracks, Overlays, Routes, Units, and Formations List in the Tools Menu

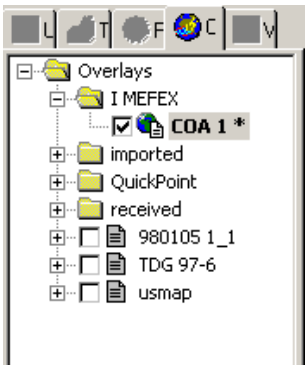


Figure 9. Tree View List of toggled option

6. Status bar

The **Status Bar** appears at the bottom of the C2PC window.

Figure 10. Status Bar

There are separate areas of status information listed along this bar:

- The left portion of the **Status Bar** displays the current position of the cursor. The position may be displayed as a Lat/Lng, Military Grid Reference System (MGRS), or UTM value depending on the C2PC settings.
- The next portion of the **Status Bar** contains up to three icons, indicating whether any alerts have been received, and whether the Gateway and data source are up or down.
- The next portion of the **Status Bar** contains a box showing the current map center and width.
- The far right portion of the **Status Bar** displays the current date and time.

III. The Menu Bar

Like any typical Windows application, the menus are your access to system command features. C2PC menus can be used to execute commands and to control the way data appears in the C2PC Main window.

The following menus appear on the default C2PC menu bar:

- File
- Map
- Favorites
- Declutter
- Tools
- Window
- Help

NOTE: Menus and icon commands operate in the same way. You can use either tool to execute the menu commands.

These are the default menus. Other menus are available when you activate any of the **C2PC Injectors/Mission Applications** (**Units**, **TBMD**, **VMF**, **Formations**, **Trackplot**, **Routes,** and **Overlays**). You can access these systems through the **Tools** menu. Some of the menu commands also have a corresponding icon on one of the toolbars.

A. File Menu

Use the **File** menu to open, close, or save map windows; print maps; insert and view objects; or exit C2PC.

NOTE: Most of these features are standard Windows applications features found in any Commercial of the Shelf (COTS) software. The explanation of some features commonly found in COTS will be omitted; some will be done in a very simplistic way.

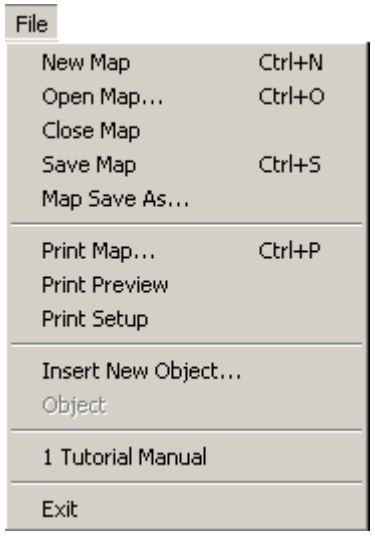


Figure 11. File Menu

1. New Map

To open a new map window, use the **New Map** (Figure 12) menu command or click the **New Map** icon in the **Toolbar**  . You can have multiple map windows open at the same time. Each window may display the same or a different map. Figure 13 shows four map windows open at once.

Figure 12. New Map

Like a typical MS-Windows application you can use the **Cascade** and **Tile** commands in the **Window** menu to arrange multiple maps on the screen.
Each geographic map window in a multiple-map display can have different plot settings. For example, one map can show tracks for a whole-world view, while another map can display a magnified map area to show tracks for that location. Figure 13 shows four maps from different geographical locations.

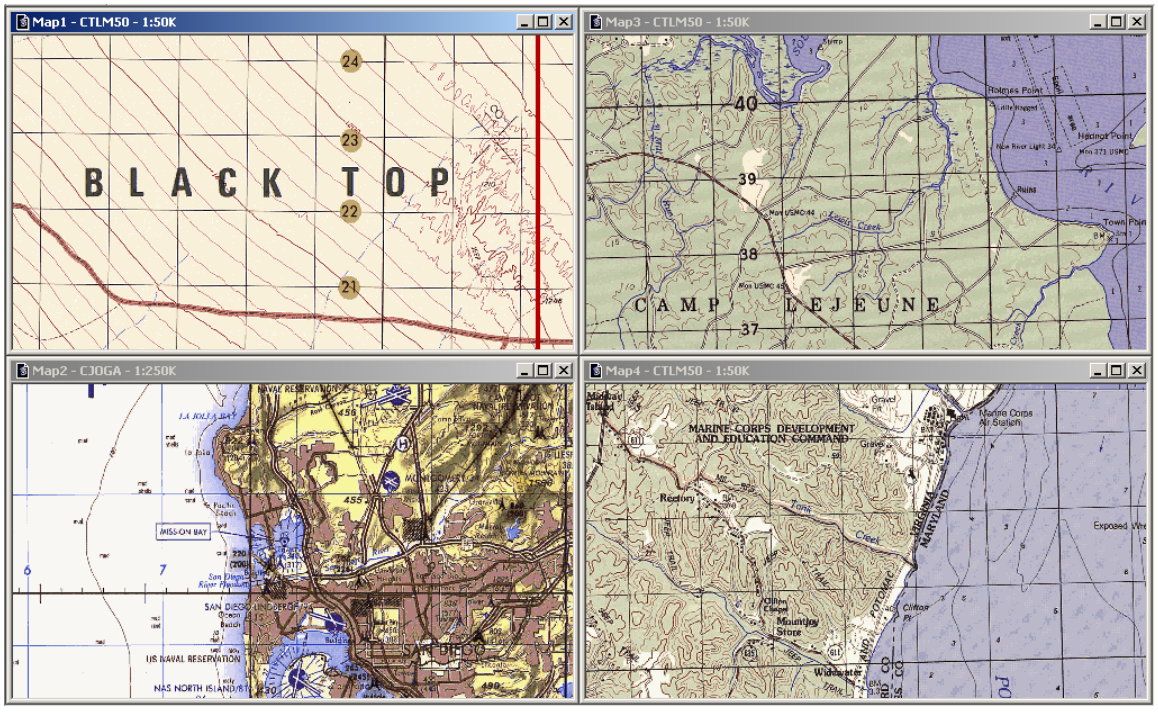


Figure 13. Multiple Maps Windows

2. Insert New Object

Many different file types can be embedded into the C2PC map window, including Microsoft Word files, Microsoft Power Point Slides, Wave Sound files, and Bitmap Image.

To embed an object, choose the **Insert New Object** command to display the **Insert Object** dialog box.

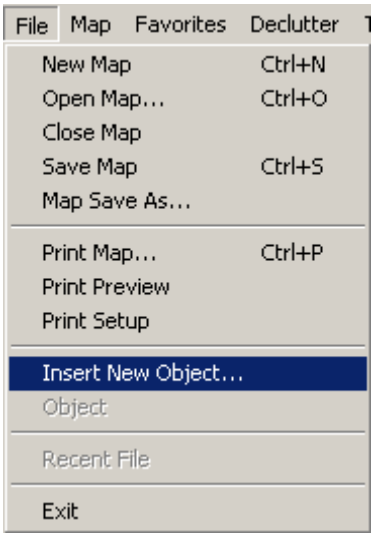


Figure 14. Insert a New Object

Once the dialog box is open you can embed an object by creating it new or from an existing object. To embed an object:

- Select an object type from the scroll list.

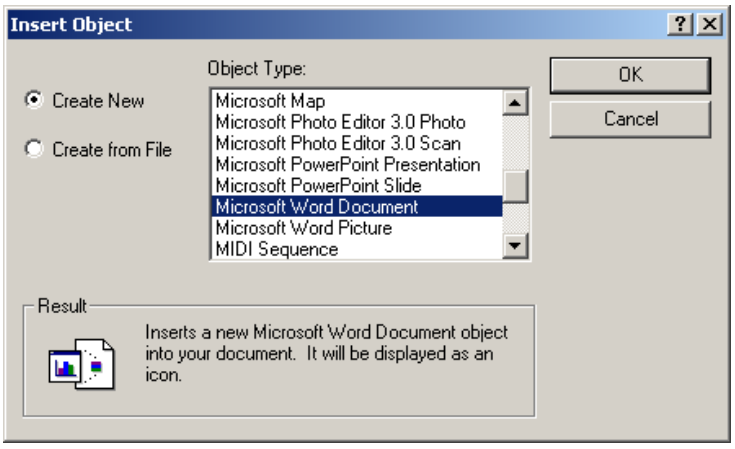


Figure 15. Insert Object Window

- Check either the **Create New** or **Create From File** radial button. If you select the **Create New** option, a new file of the type selected will be inserted into the map window. If you select the **Create From File** option (Figure 16), you must enter a pathname or use the **Browse** button to choose a file that has already been created to import into the map window.

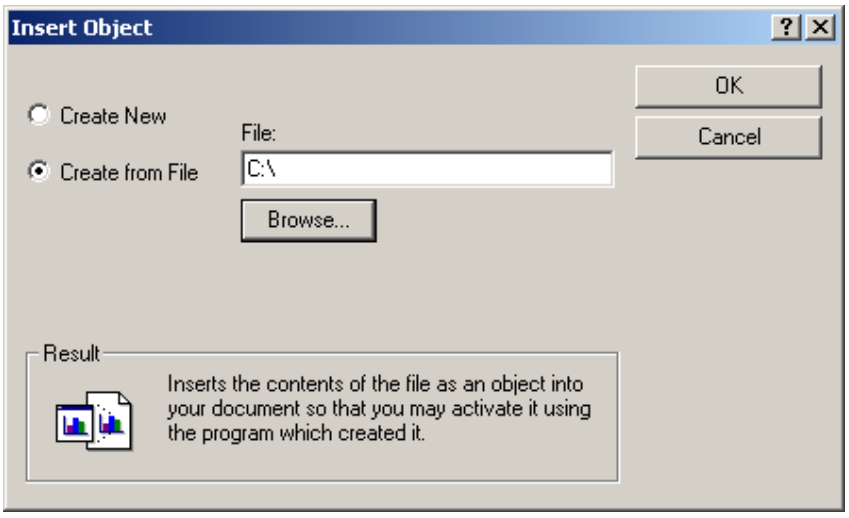


Figure 16. Insert Object from File Window

- When your choices have been selected, view your selections in the **Result** box. When complete, click the **OK** button to insert the object into the map window. The file is inserted into the center of the map window as an icon. Click the icon to display a small white drag box in the icon. You can select that object and drag the icon to another part of the map window if you wish. Double-click the icon to open the file. To delete an object, select the object and press the **Delete** key from the keyboard.

B. Map Menu

The Map menu (Figure 17) options allow you to manipulate the map view by zoom, re-center the map to you position of choice, change the width of your view (the map width), change the lighting of the map by dimming or brightening the map, and change the map colors of the vector maps. The **Map** menu also has some commands that will allow you to

- Change projections.
- Show political boundaries, rivers, roads, and grid lines.
- Declutter the map.
- Set plot options.
- Toggle the toolbar and the status bar on or off.

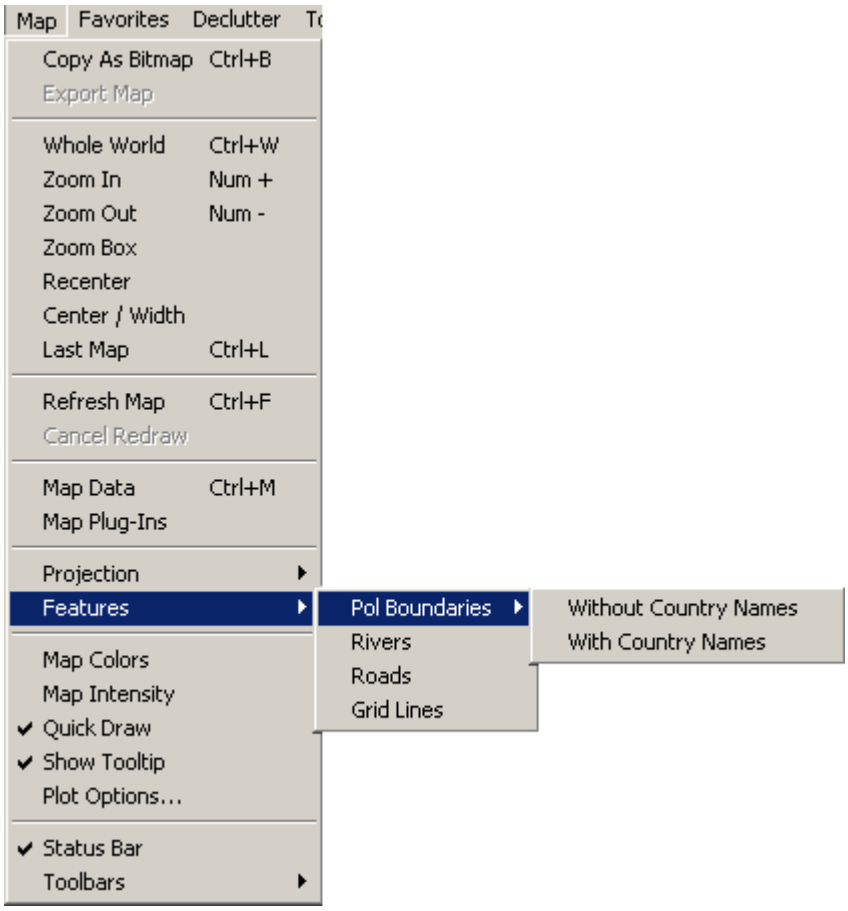


Figure 17. Map Window

1. Copy As Bitmap

Use the **Copy As Bitmap** option to copy the currently displayed map to the clipboard. The map can then be pasted into another application.

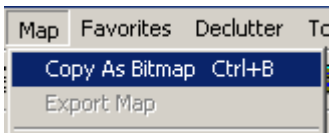


Figure 18. Copy As Bitmap

NOTE: A typical example would be to copy your product and paste it into a Microsoft PowerPoint slide in order to present a Course of Action (COA).

Once you have clicked the **Copy As Bitmap** label, the map will be copied to the clipboard. There are two methods to paste the content of the clipboard (our map) into a PowerPoint presentation, using the **Edit** menu or by right clicking the mouse. Figure 19 shows you the use of the right click in PowerPoint. In PowerPoint, locate the cursor inside the slide area and then right click the mouse once. You should get a screen like Figure 19. Proceed and click the ***Paste*** option in order to add your map into the

PowerPoint slide. After completing that last step you will have your map in the slide (Figure 20).

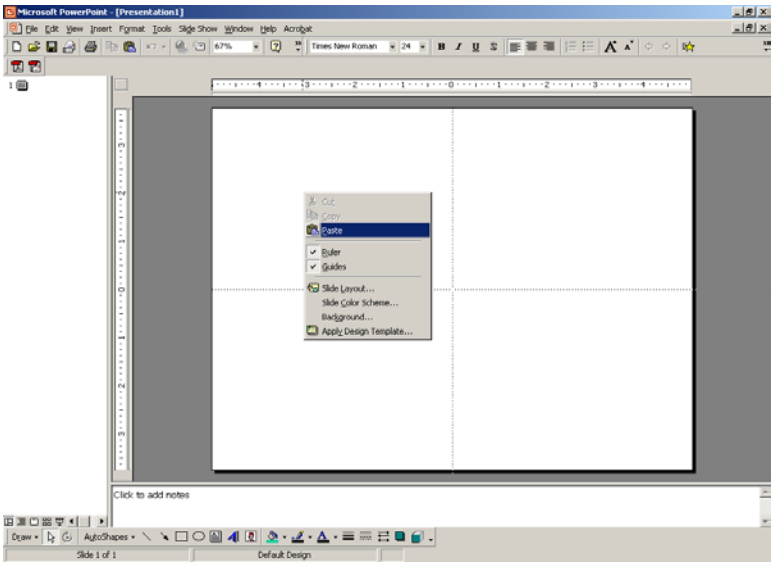


Figure 19. Using right click in PowerPoint to paste a map bitmap

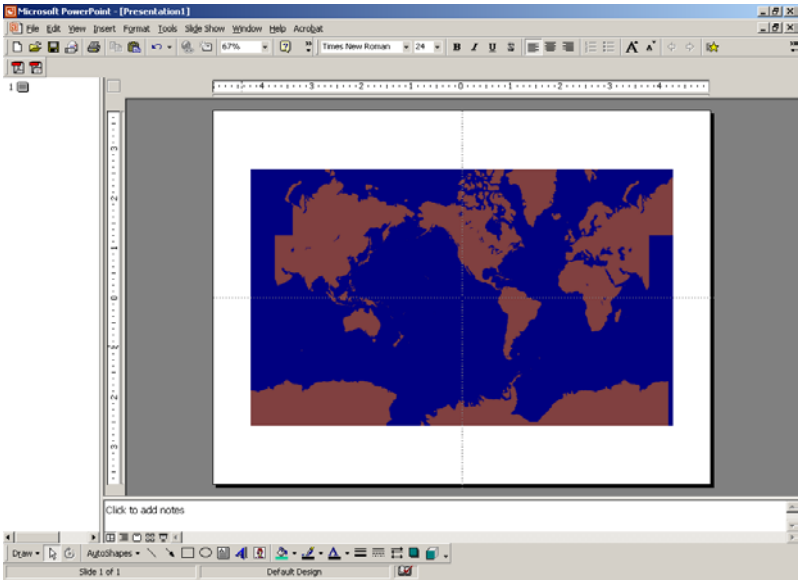


Figure 20. The pasted map in PowerPoint

The same result is achieved by using the **Edit** menu and **Paste** option. Figure 21 shows the use of the **Edit** menu on PowerPoint to paste our map.

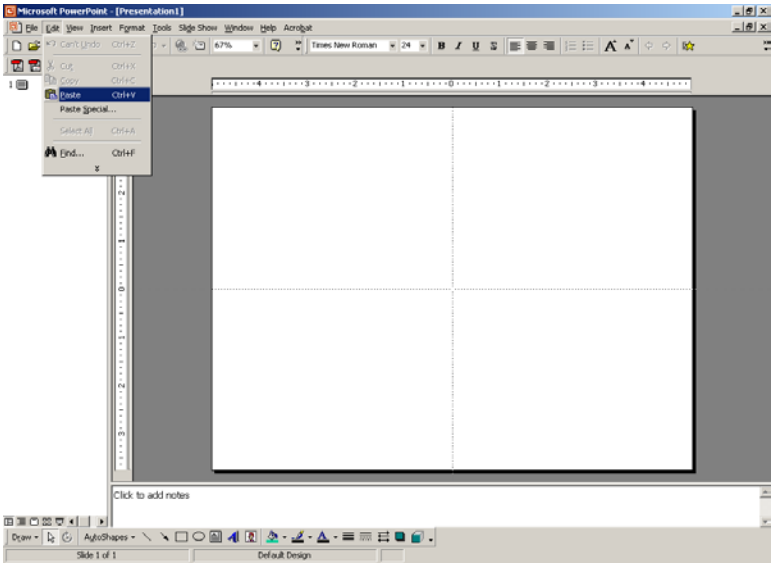


Figure 21. Using the Edit menu in PowerPoint to paste a map bitmap

2. Center / Width

Centers the map around a chosen position and changes the map width to a specified value. Choose the **Center/Width** option to display the Center/Width window (Figure 22).

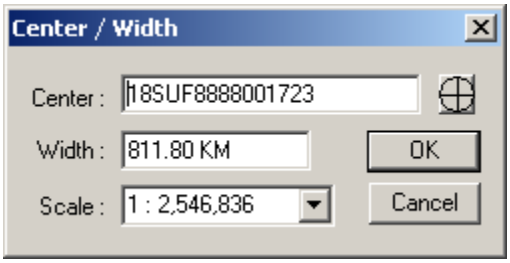


Figure 22. Center / Width Window

3. Map Data

Use the **Map Data** option to locate digital maps and make them available to the C2PC system. The **Map Data** window contains two tabs to allow you to view different map data information.

The **Data Paths** tab (Figure 23) is the first tab, while the second tab is either **Maps** or **Datasets**, depending on which **Map Data View Mode** toggle was chosen from **Tools: Options** (Figure 24).

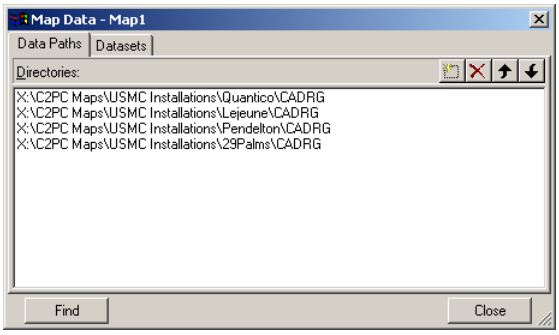


Figure 23. Data Paths window

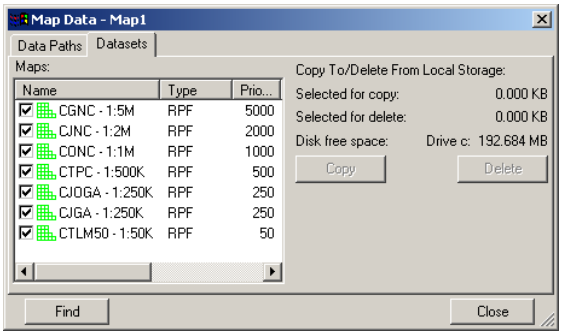


Figure 24. Datasets window

4. Features

The **Features** menu option allows you to toggle on or off some display features for the map. The **Features** option displays a cascading menu containing the following features:

- Pol Boundaries
- Rivers
- Roads
- Grid Lines

A checkmark appears before the features that are turned on. You may turn on any or all features. By default, all features are turned off.
The color of each respective feature is set with the **Map: Map Colors** option.

a. Pol Boundaries

Displays political boundaries between countries. The **Pol Boundaries** option contains a cascading menu with **Without Country Names** and **With Country Names** choices.

Figure 25. Political Boundaries without country names

b. Rivers

Displays rivers on the map. Rivers map data is available for the entire world. Note that rivers will only be displayed when the map scale is at or below the **River Scale** setting from **Tools: Options**, under the **Defaults** tab.

c. Roads

Displays roads on the map. **Roads** appear in red on the map. **Roads** map data is available for then entire world. Note that roads will only be displayed when the map scale is at or below the **Roads Scale** setting from **Tools: Options**, under the **Defaults** tab.

d. Grid Lines

Displays grid lines on the map. Five latitude and five longitude grid lines are usually displayed, approximately equally spaced across the screen. For some zoom factors, three or four latitude and longitude grid lines are displayed. For very long range map views, the grid lines display only lat/lng hours. For scaled in map views, the grid lines display lat/lng hours and minutes. When the map is scaled in very close, lat/lng hours, minutes, and seconds appear.

NOTE: The use of these features slows system performance.

5. Map Color

Allows you to modify the color of the active map, by redefining the colors representing the land, ocean, roads, rivers, political boundaries, and grid lines. The same functionality can be accomplished by selecting the icon on the **Standard toolbar**  .

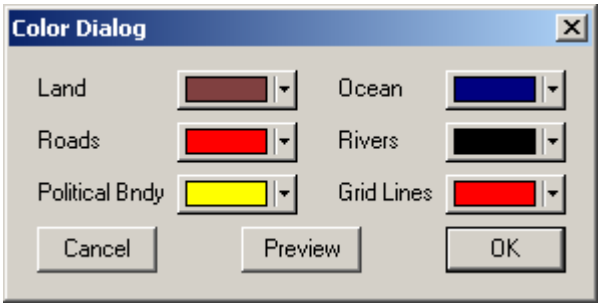


Figure 26. Change Color window

6. Map Intensity

Use the **Map Intensity** option to dim or brighten the map. Select the Map Intensity option to display the **Map Intensity** window. The same functionality can be achieved by selecting the appropriate icons in the **Standard toolbar**  .

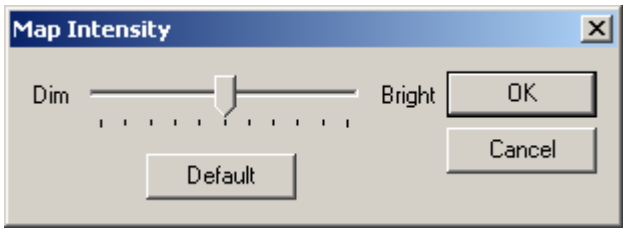


Figure 27. Map Intensity Window

7. Quick Draw / Flexible Draw

There are two methods available for automatically redrawing maps: **Quick Draw** and **Flexible Draw**. The **Quick Draw** toggle allows you to switch between the two methods. If **Quick Draw** is on, a checkmark appears before the **Quick Draw** option name in the menu. If **Flexible Draw** is on, no checkmark appears.
When **Quick Draw** is on, the following things happen when a raster map is available:

- Maps automatically redraw much faster.
- The **Map: Projection** option is disabled when a raster map is displayed.
- When the right mouse button is used in the map window to display the pop-up menu, an **Other Maps** option appears. Use this option to display another map from a cascading list of available maps. Only maps which are supported in **Quick Draw** will be displayed. These include:
  - ADRG-PX,
  - BSB, NITF
  - RPF maps.
- The **Next Up** and **Next Down** (**Move Toolbar**) buttons are available in the toolbar. Use these options to change the view to the next map up or down.

NOTE: The **Quick Draw** method greatly speeds up the drawing process.

When **Flexible Draw** is on, the following things happen when a raster map is available:

- Maps automatically redraw slower, but this is not noticeable with most maps.
- The **Map: Projection** option is available to allow you to switch between different map projections.

- When viewing the vector map, the map view will automatically switch to a raster map view when the center point is over a raster map and the scale is reduced to a scale between the minimum and maximum scale for the raster map.

8. Show Tooltip

Use this option to toggle the tooltip feature on/off. When on, a tooltip will appear when the cursor is over a track in the map window.
The tooltip displays the timelate and the position for the track.

9. Status Bar

Toggles the display of the **Status Bar** off and on. A check mark means the Status Bar is displayed. The **Status Bar** is located across the bottom of the C2PC Main window

10. Toolbars

The **Toolbars** option contains a cascading menu with **Standard** and **Moving** choices. If an option which contains another toolbar option is loaded (for example, the **Quick Point** option), an additional **Snap In** choice is listed. Use this option to toggle the display of any of these toolbars off and on. A check mark means the toolbar is displayed.

C. Declutter Menu

The **Declutter** menu contains commands to allow you to automatically or manually declutter tracks and overlays in the map window. The commands in the **Declutter** menu always work for decluttering tracks. To declutter overlays, the **Declutter Overlays** toggle from the **View** menu must be turned on from the **Overlays** menus, (i.e. the Overlays injector is active). If the **Declutter Overlays** toggle is not turned on, the **Declutter** menu commands will not work for decluttering overlays.

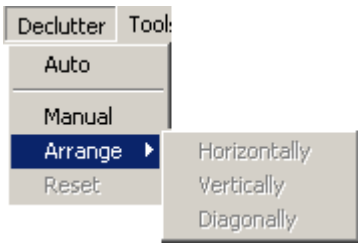


Figure 28. Declutter Menu

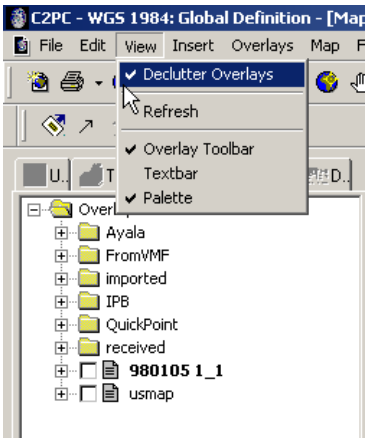


Figure 29. Declutter Overlays toggled on

1. Auto

Use the **Auto** option to redraw any track or overlay labels in the map window to minimize the amount of label overlap. Figure 30 shows a portion of the map window with **Auto Declutter** off (left view) and with **Auto Declutter** on (right view).

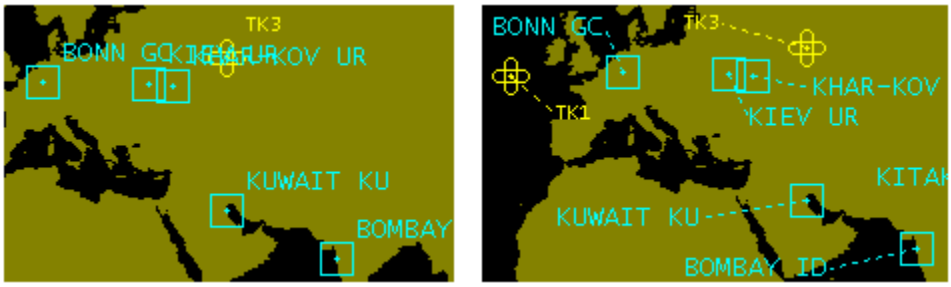


Figure 30. Auto Declutter Off (left), Auto Declutter On (right)

Turn **Auto Declutter** on to declutter the map window immediately, and to keep it decluttered as changes are made. The screen declutters every time a change occurs in the map window, such as a track update or a change in the map view.
Turning **Auto Declutter** on produces these results:

- In areas where track labels overlap, the labels are separated so they can be read.
- Dotted lines appear, extending from the labels to their track symbols.
- In particularly cluttered areas of the display, some labels may be moved some distance from the track position, or may not appear at all.

In **MIL-STD-2525** mode, the entire symbol plus all of its labels move when **Auto Declutter** is on. If a symbol cannot be placed, it is displayed as a dot. A dotted line is drawn from the location of the symbol to the declutter symbol.

2. Manual

Use the **Manual** command to manually declutter tracks and overlays in selected areas of the map window. When the **Manual** command is used, only selected tracks and overlays are decluttered. Tracks and overlays can be selected before or after the **Manual** command is turned on and they will be decluttered.
Tracks and overlays can be manually decluttered further by moving them in the map window. When the **Manual** command is turned on and a track or overlay is selected, a small yellow dot appears next to the object label. Drag the yellow dot to move the label to a new location in the map window. You may select a group of objects, then drag one of their yellow dots to move the selected labels as a group.

3. Arrange

The **Arrange** command is available only when the **Manual** command is turned on. The **Arrange** command contains three choices on the submenu- **Horizontally**, **Vertically**, and **Diagonally**.
If none of the **Arrange** submenu selections are turned on, selected tracks and overlays are decluttered in the same way as with the **Auto** command. If one of the submenu commands is chosen, the declutter is performed according to that choice.
When the **Horizontally** command is chosen, any selected objects are decluttered with their labels displayed horizontally in the map window. When the **Vertically** command is chosen, selected objects are decluttered with their labels displayed vertically in the map window. When the **Diagonally** command is chosen, selected objects are decluttered with their labels displayed diagonally in the map window.

4. Reset

Use the **Reset** option to turn off any manual decluttering that has been performed. All tracks are returned to their non-decluttered state.

D. Tools Menu

The **Tools** menu (Figure 31) contains various options that provide very powerful capabilities within C2PC. It is in here that you can turn on or off injectors/mission applications and change default settings in C2PC.

1. Units/ Trackplot/ Routes/ Overlays/Tbmd

This is the Injectors group. (Units, Tbmd, Vmf, Formations, TrackPlot, Routes, and Overlays) They are toggle options. If any of these options is selected, a checkmark appears next to the name of the option, a new window list appears in the left part of the map window, and new menus appear in the main menu bar related to the option.

2. Quick Range/Bearing

The **Quick Range/Bearing**  option only appears on the **Tools** menu if **USCG Standard Client** was chosen from the Setup Type window during C2PC installation or if the **QuickRangeBearing** module was chosen during a Custom installation. From a Custom installation, the **QuickRangeBearing** module is located under the **Atlas/TDAs** section.
Use the **Quick Range/Bearing** option to draw a line in the map window which shows the range and bearing from a starting point to the end point (Figure 32). Up to 10 quick range/bearing

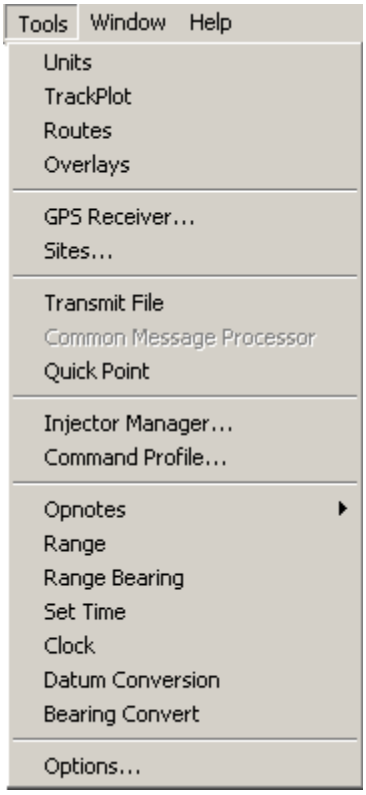


Figure 31. Tools Menu

lines can be placed in the map window. When an 11th is created, it replaces the first quick range/bearing line. **Quick Range/Bearing** lines disappear from the system when the map window where they are located is closed.

Figure 32. Quick Range/Bearing Line Example

Choose the **Quick Range/Bearing** option from the **Tools** menu (or click the **Quick Range/Bearing** tool from the **Snap In** toolbar) to draw a range/bearing line in the map window.

To view and change attributes of the quick range/bearing, double-click the quick range/bearing line (or choose the **Properties** option from the context menu for a quick range/bearing line) to display the **Quick Range/Bearing Properties** window.

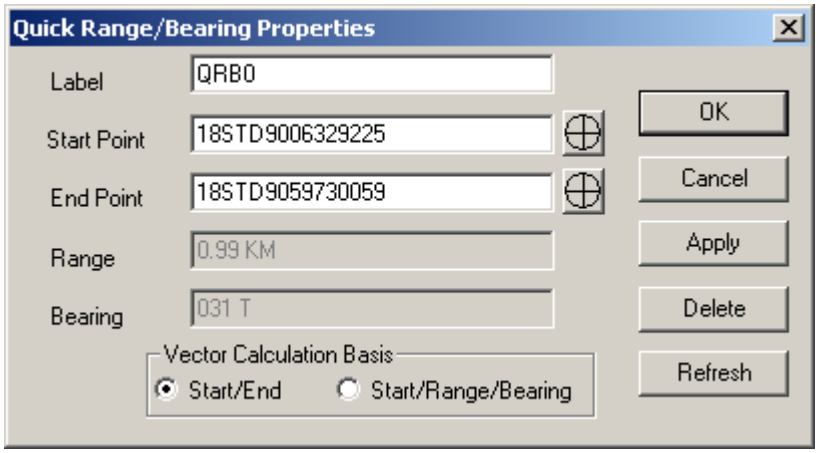


Figure 33. Quick Range / Bearing Properties window

The **Quick Range/Bearing Properties** window displays a group of fields for the line, along with some buttons in the right part of the window for actions that can be taken for the line.

a. Start Point

Displays the starting position of the line. You may edit the position by typing in a new value in this field, or by clicking the crosshairs button next to the field and clicking a new position in the map window.

b. End Point

Displays the ending position of the line. If the **Vector Calculation Basis** knob is set to **Start/End**, you may edit this position by typing in a new value in this field, or by clicking the crosshairs button next to the field and clicking a new position in the map window.
If the **Vector Calculation Basis** radial button is set to **Start/Range/Bearing**, this field is not editable and will be automatically calculated based on the values entered in the **Start Point, Range**, and **Bearing** fields.

c. Range

Displays the range from the start point to the end point. If the **Vector Calculation Basis** radial button is set to **Start/End**, this field is not editable and will be automatically calculated based on the values entered in the **Start Point** and **End Point** fields. If the **Vector Calculation Basis** radial button is set to **Start/Range/Bearing**, you may edit this value by typing in a new value in this field.

d. Bearing

Displays the bearing of the line. If the **Vector Calculation Basis** radial button is set to **Start/End**, this field is not editable and will be automatically calculated based on the values entered in the **Start Point** and **End Point** fields.
If the **Vector Calculation Basis** radial button is set to **Start/Range/Bearing**, you may edit this value by typing in a new value in this field.

3. Quick Point

The **Quick Point** command is used to place a small icon in the map window. This is often used as a marker or to identify a particular type of object. Up to ten quick point icons can be placed in the map window. When an eleventh is created, it replaces the first quick point icon. Choose the **Quick Point** command from the **Tools** menu (or click the **Quick Point** tool from the **Snap In** toolbar) to place a quick point icon in the map window. When the **Quick Point** command is chosen, the pointer changes to display a happy face icon next to the pointer. Click anywhere in the map window and a quick point icon is placed at that point.

a. Properties

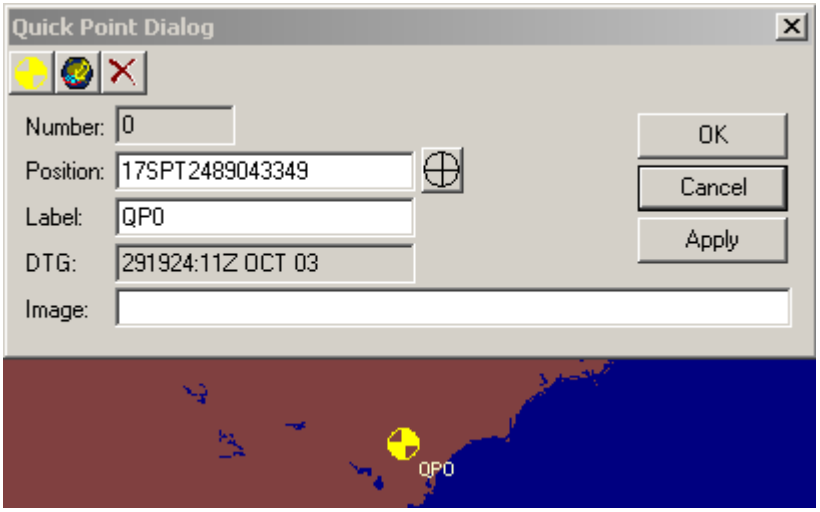


Figure 34. Quick Point dialog

i. Position

This displays the position of the quick point. You may edit the position by typing in a new value in this box, or by clicking the crosshairs button next to the box and clicking a new position in the map window.

ii. Label

This displays the label for the quick point. The label appears in the map window next to the quick point. A default label of QP0 appears for the first quick point, QP1 for the second, etc. After QP9, the next quick point wraps to QP0, and

any existing QP0 point is deleted. You may edit the label by entering a new value in this box. If you change the label, you must click the OK or Apply button for the new label to take effect.

iii. DTG

This displays the date-time group for when the quick point was created. This box is not editable.

4. Injector Manager

Use the **Injector Manager** to toggle on/off any of the first group of options on the **Tools** menu and organize them in any order. The Injector Manager affects the Units, Routes, TrackPlot, Overlays, Formations, and Tbmd options. Choose the **Injector Manager** command to display the **Injector Manager** dialog box (Figure 35).

a. Available injectors

This box contains a list of C2PC injectors or mission applications that can be toggled on/off and reorganized. To toggle any of the commands on/off, click the check box to the left of the command name in the list in order to make it available in C2PC.

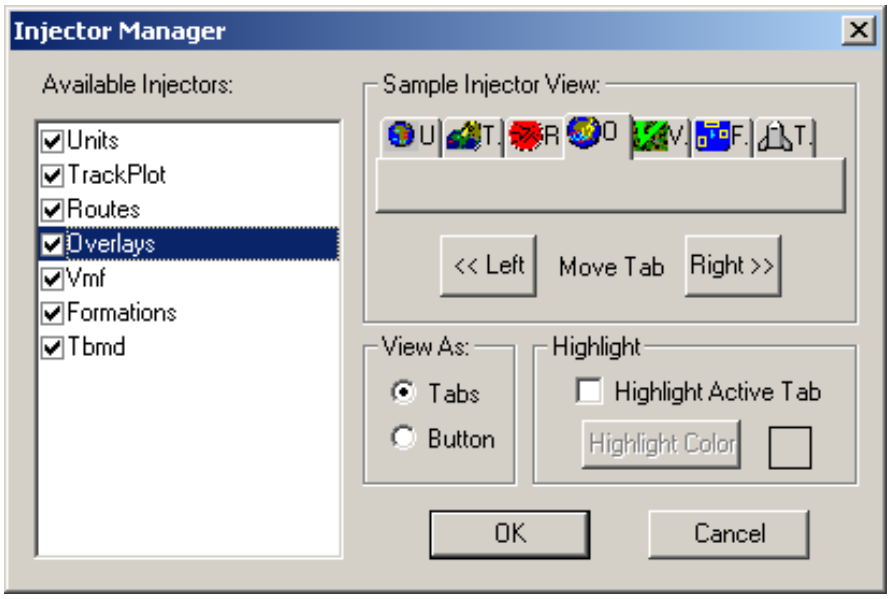


Figure 35. Injector Manager dialog box

5. Range

Use this command to display a range value from a chosen position in the map window outwards to the pointer position. Note that you can choose this command from either the **Tools** menu or from the **Range** button on the main toolbar  . Choose the **Range** command to toggle it on. Left click anywhere in the map window to create a

hook point. A red dot appears to mark the hook point. Keep the mouse left button down and drag the mouse in the desire direction. The line you draw is freeform and does not have to be straight. When you release the mouse button, the range from the hook point to the end of the line is displayed (Figure 36). To select a new hook point, move the pointer to where you want the hook point and click. To turn this command off, select the **Range** command again from the **Tools** menu or from the toolbar.

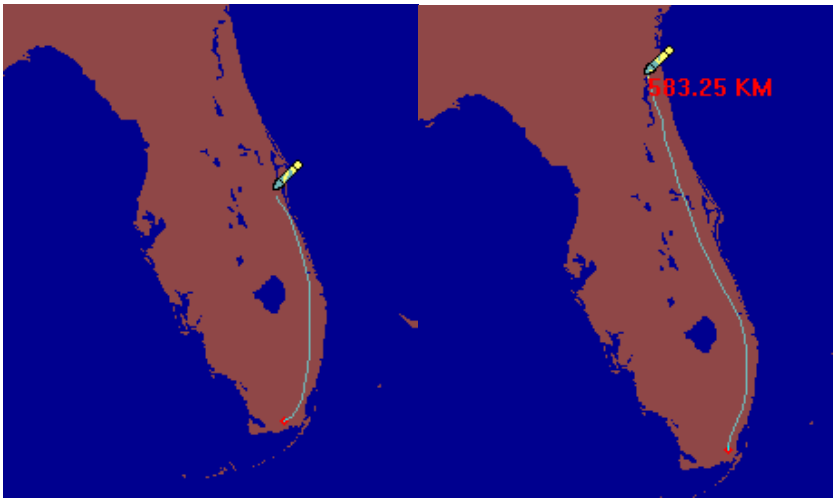


Figure 36. Range tool

6. Range Bearing

Use this command to display a bearing and range value from a chosen position in the map window outwards to the pointer position. Note that you can choose this command from either the **Tools** menu or from the **Range Bearing** button on the main toolbar.

The displayed range can be shown as either a rhumbline or a great circle. Click the down arrow to the right of the **Range Bearing** button on the main toolbar to display a list with **Rhumbline** and **Great Circle** choices. A check mark appears before the currently selected choice.

Rhumbline: land movement
Great Circle: air and ship movement

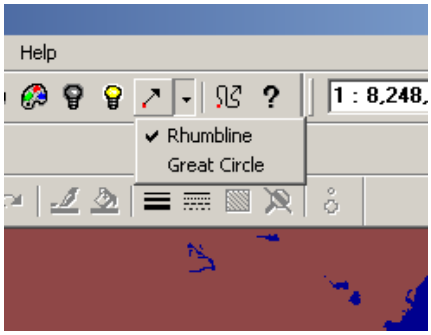
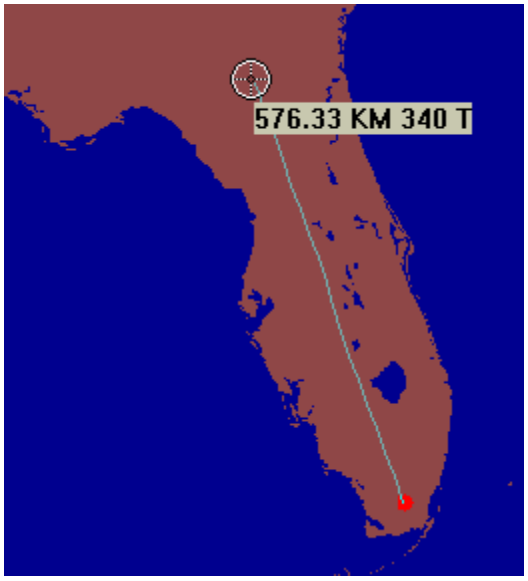


Figure 37. Rhumbline or Great Circle selection

Choose the **Range Bearing** command to toggle it on. Click anywhere in the map window to create a hook point. A big red dot appears to mark the hook point. A box appears below the pointer showing the position of the hook point. As you move the pointer away from the hook point, the range and bearing from the hook point to the pointer position is displayed in the box below the pointer. To select a new hook point, move the pointer to where you want the hook point and click. To turn this command off, select the **Range Bearing** command again from the **Tools** menu.
The bearing is displayed in **True North**, **Grid North**, or **Magnetic North**, depending on C2PC settings.
To select a new hook point, move the pointer to where you want the hook point and click the mouse button.
To turn this option off, select the Range Bearing option again from the Tools menu or click on the Range Bearing button on the main toolbar.



Note: To change the settings of bearing measurement go to **Tools: Options**, in the bearing section under the **Display** tab.

Figure 38.Range Bearing tool

7. Datum Conversion

Use the **Datum Conversion** option (Figure 39) to quickly compare position information for two different datums. Select the **Datum Conversion** option to display the Dialog window.

NOTE: You will need to use this tool if you ever have a grid coordinate that is different from WGS-1984 (default datum). The **Datum Conversion** tool can compute positions between the foreign and WGS-1984 datum types.

The Dialog window contains an **Input** and an **Output** box. Each of these boxes contains a **Datum**, **LatLng**, **Utm**, and **MGRS** field. To compare two datums, select a datum in the

Input box and select a different datum in the **Output** box. To choose a different datum in either box, click the right arrow button and choose a new datum from the list. Enter a position in any of the three position fields in the **Input** box and click the **Compute** button to compute equivalent position information in all the other fields in this window. You may perform other datum comparisons by changing datums and positions and clicking the **Compute** button.

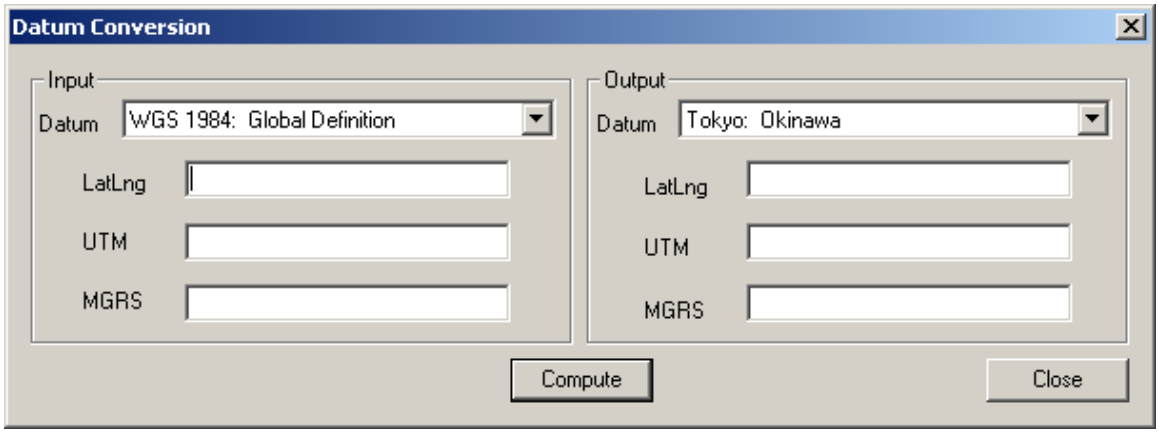


Figure 39. Datum Conversion

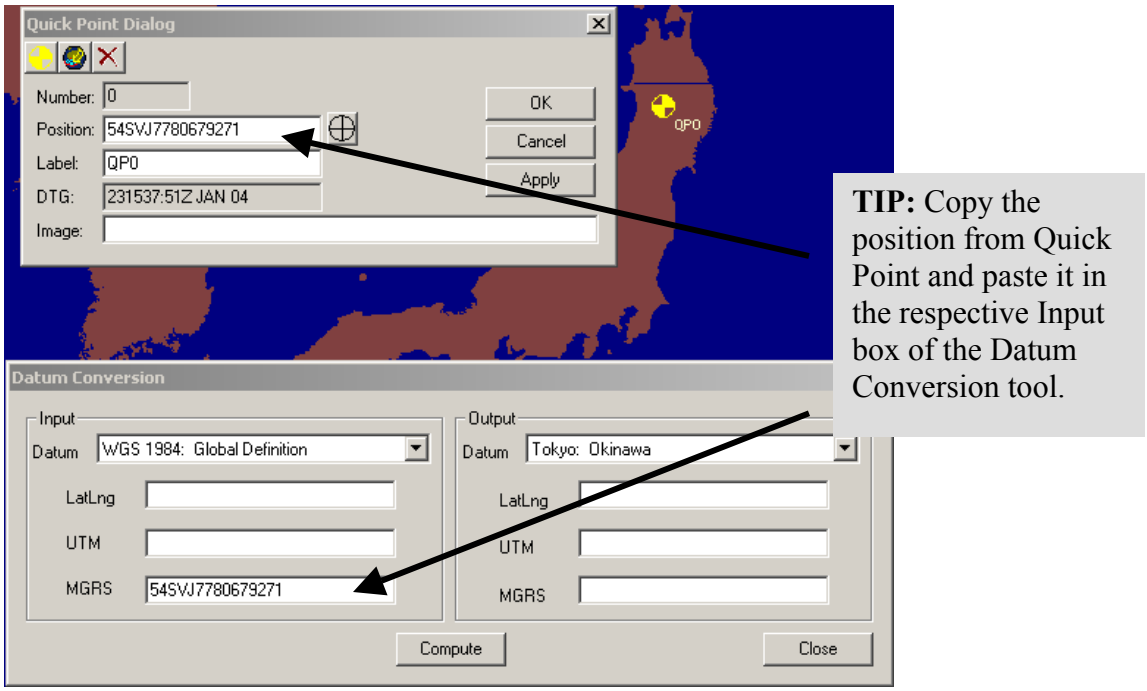


Figure 40. Using Quick Point for getting a position to use in Datum Conversion

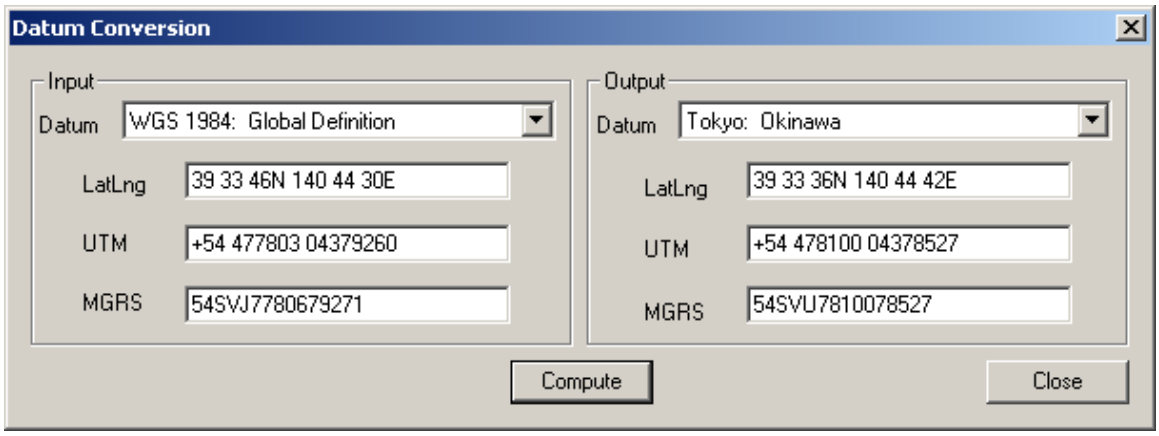
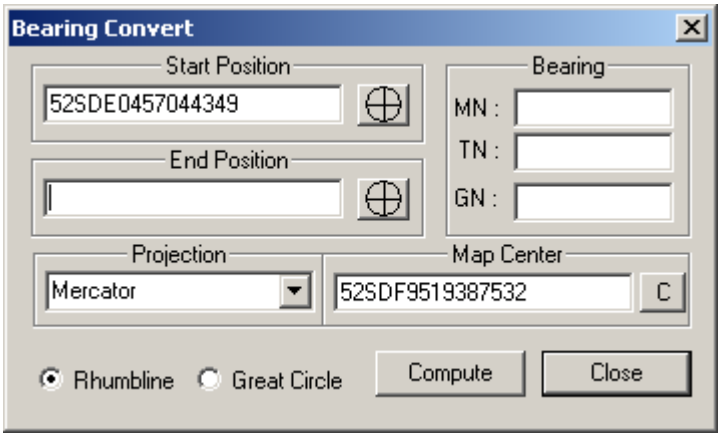


Figure 41. Datum converted

8. Bearing Convert

Use the **Bearing Convert** option to display a bearing's value in **Magnetic North**, **True North**, and **Grid North**.

Select the **Bearing Convert** option to display the **Bearing Convert** window (Figure 42).



Note: The map center value is also placed in the **Start Position** field as the default value when the window is first opened.

Figure 42. Bearing Convert

The **Map Center** field automatically displays the current map center when the **Bearing Convert** window is first opened.

To compute bearing values based on a bearing line, enter the start position of the bearing line. Enter the position from the keyboard or by clicking the crosshair button and selecting a position in the map window.

Perform the same procedure for the end position. When done, basically click **Compute**. The **Magnetic North (MN)**, **True North (TN),** and **Grid North (GN)** bearing values for the bearing line are displayed in the **Bearing** box.

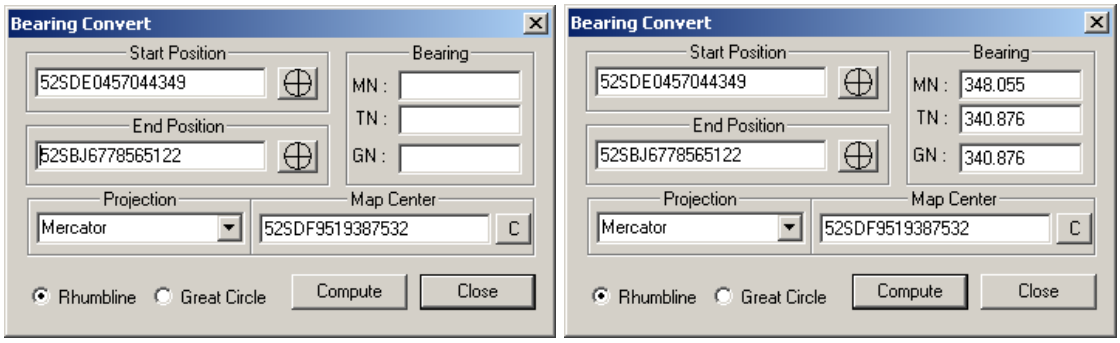


Figure 43. Using the Bearing Convert Tool

9. Options

Use **Options** to display a **C2PC Options** dialog box, which contains six tabs of general settings information for the C2PC workstation: **Display**, **Defaults**, **Connection**, **Import**, **GPS Track**, and **Vmf Multiplexer**.

The **Display** tab contains unit and precision settings to allow you to define how fields will display (for example, whether the position is displayed as a lat/lng, MGRS, or UTM value).
The **Defaults** tab allows you to choose from a list of datum choices to be used for the map view. The map mode, symbol mode, and range bearing mode can also be set through this tab.
The **Connection** tab contains Gateway connection settings needed to properly connect between the Client and Gateway.
The **Import** tab contains import settings, along with user name and password. The import settings are necessary to allow import of overlays and opnotes from the UB host machine to the Client.
The **GPS Track** tab contains information about the track set to represent GPS Own Track.
The **VMF Multiplexer** tab contains VMF transmission settings.
The settings under the **Connection** tab and the **Import** tab are entered during installation of the C2PC software. They are available here in case there is a need to modify any of these settings if machine connections change or for any other reason.

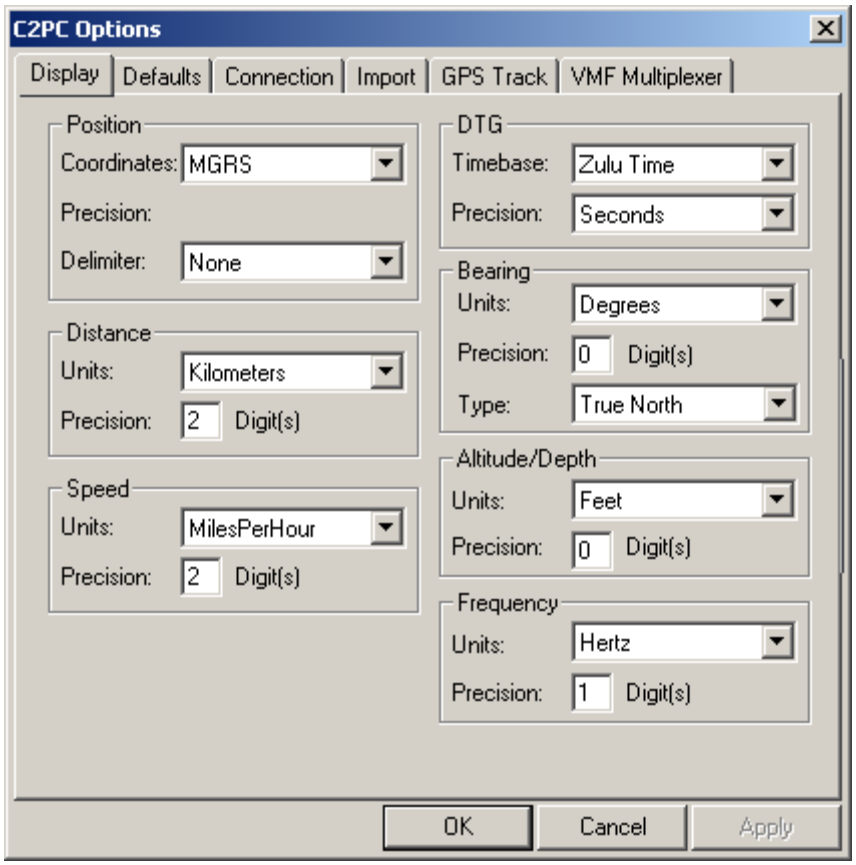


Figure 44. C2PC Options, Display Tab

a. Display Tab

You may modify any of the settings under the **Display** tab (Figure 44), and any fields within C2PC which use those setting types will reflect the chosen settings. In all of the Precision fields, enter the number of decimal places that will be shown for those values.

i. Position

Position values can be shown in Lat/Lng, MGRS, or UTM. If the value is Lat/Lng, a precision value can be set. The precision can be set to Degrees, Minutes, Seconds, 100th Degrees, 1000th Degrees, 10th Seconds, 100th Seconds, 10th Minutes, or 1000th Minutes. For any position value, a delimiter can be set. The delimiter can be a space, colon, dash, or none. If the position value is MGRS or UTM, the position value will be displayed with Easting first, followed by Northing.

ii. Distance

Distance values can be shown in Nautical Miles (NM), Kilometers, Meters, Yards, Feet, or Statute Miles. A precision value can be set.

iii. Speed

Speed values can be shown in Knots, Kilometers per hour, or Miles per hour. A precision value can be set.

iv. DTG

DTG values can be shown in Zulu time or local time. A precision value of seconds or minutes can be set.

v. Bearing

Bearing values can be shown in degrees (0-360) or mils (0-6400). A precision value can be set. The bearing type can be set to display in True North, Magnetic North, or Grid North.

vi. Altitude/Depth

Altitude/Depth values can be shown in Feet, Fathoms, or Meters. A precision value can be set.

vii. Frequency

Frequency values can be shown in Hertz or Mega Hertz. A precision value can be set.

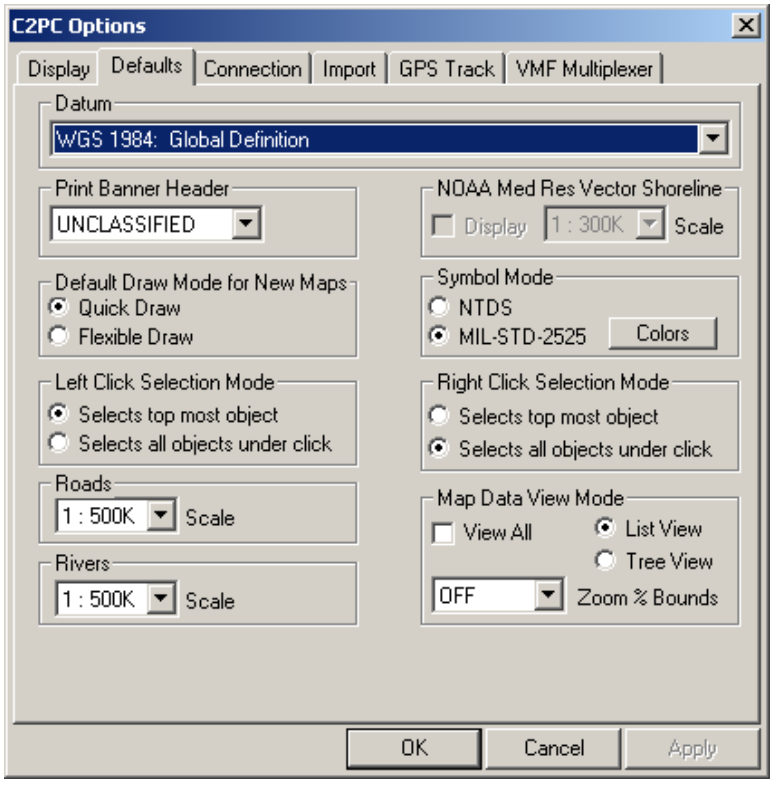


Figure 45. C2PC Options, Defaults Tab

b. Default Tab

i. Datum

The top field in this window displays the currently selected **datum**. The default value is WGS 1984. To choose a different datum, click the down arrow to display all the available datum choices and choose the datum you want from the list. When a new datum is chosen, the map window changes slightly to adjust to the chosen datum.

NOTE: The currently selected datum is also displayed in the title bar of the C2PC Client window.

NOTE: The new datum is also displayed in the title bar in the C2PC Client window.

ii. Print Banner Header

Choose the classification level that will display on anything printed from C2PC. Choices include UNCLASSIFIED, CONFIDENTIAL, SECRET, and TOP SECRET.

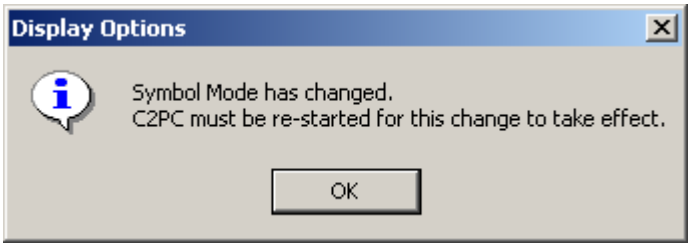
iii. Default Draw Mode for New Maps

Choose either the **Quick Draw** or **Flexible Draw** radial button to specify the mode for automatically redrawing maps.

NOTE: Quick Draw redraws maps much faster than Flexible Draw.

iv. Symbol Mode

Choose either **NTDS** or **MIL-STD-2525** to specify the symbol display mode.
If you change the currently selected symbol display mode, the message from Figure 46 appears.



NOTE: This affects the look of tracks and some other objects when they are plotted in the map window.

Figure 46. Symbol Mode change display message

This message lets you know that you must exit the C2PC Client and start up again for the symbol mode change to take effect.

If you select the **MIL-STD-2525** mode, a **Colors** option activates that lets you modify the color shade for each threat status symbol. Click the **Colors** button to open the **MIL-STD-2525 Color** window.

Figure 47. MILSTD 2525 color change window

Inside the **MIL-STD-2525 Color** window, click a color next to any of the threat status entries to access a shade palette. Click the shade you wish. The palette closes and the new choice replaces the former shade for that threat status.
If you click **OK** in the **MIL-STD-2525 Color** window and then click either **OK** or **Apply** in the **C2PC Options** window, a **Display Options** notification window appears (Figure 48) instructing you to refresh the map in order to activate your changes. You must first exit the **C2PC Options** window before you can refresh the map. Use one of these methods to refresh the map:

- click the **Refresh** icon on the toolbar
- select the **Map Refresh** command in the **Map** menu
- press **Ctrl+F**.

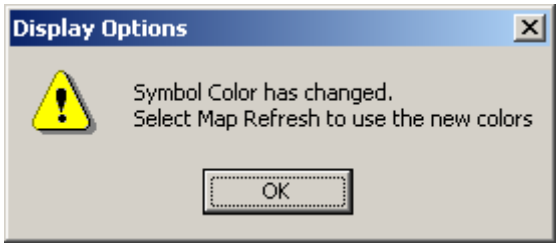


Figure 48. Symbol Color change display message

IV. Working with Maps in C2PC

C2PC is capable of reading seven map product types and two imagery types:

- ARC Digital Raster Graphic (ADRG).
- Blue Marble Chart Sewell Better Boating Association (BSB3)
- Digital Terrain Elevation Data (DTED).
- Enhanced Topographic (ETOP).
- National Imagery Transmission Format (NITF).
- Raster Product Format (RPF)
- SHAPE.
- Tagged Image File Format (TIFF).
- Vector Product Format (VPF).

A. Loading Maps into C2PC

1. Creating MAP DATA Paths

In order to start using a digital map on C2PC, we have to tell C2PC the location of those maps. The **Map Data** command will allow you to create a path to the different maps directories. This command of is accessible in three ways:

- the **Map** menu (Figure 49);
- using keystrokes **CTRL+M**;
- using the right mouse button in the map window and selecting **Map Data** from the shortcut menu (Figure 50).

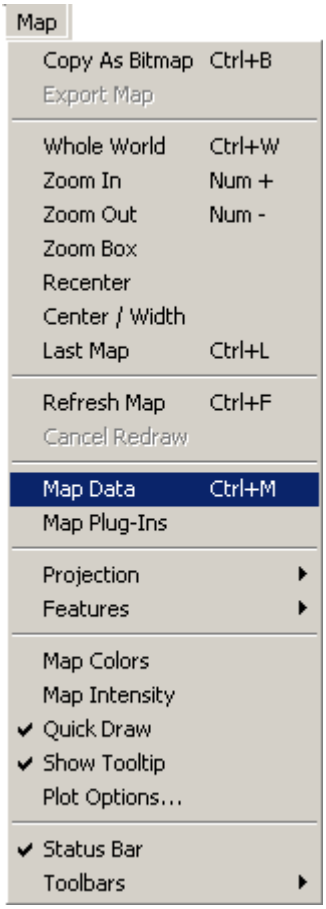


Figure 49. Map Data using Map menu

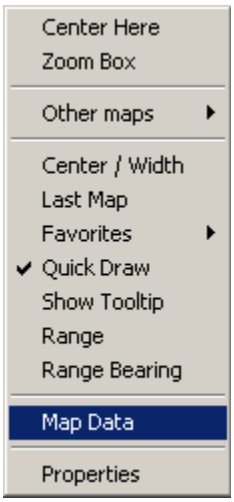


Figure 50. Map Data using right click

Once the **Map Data** command is selected, the **Map Data** window opens (Figure 51). This window contains two tabs: **Data Paths** and **Maps** or **Datasets** depending on which **Map Data** toggle is chosen from **Options** under the **Tools** menu (**Default** tab).

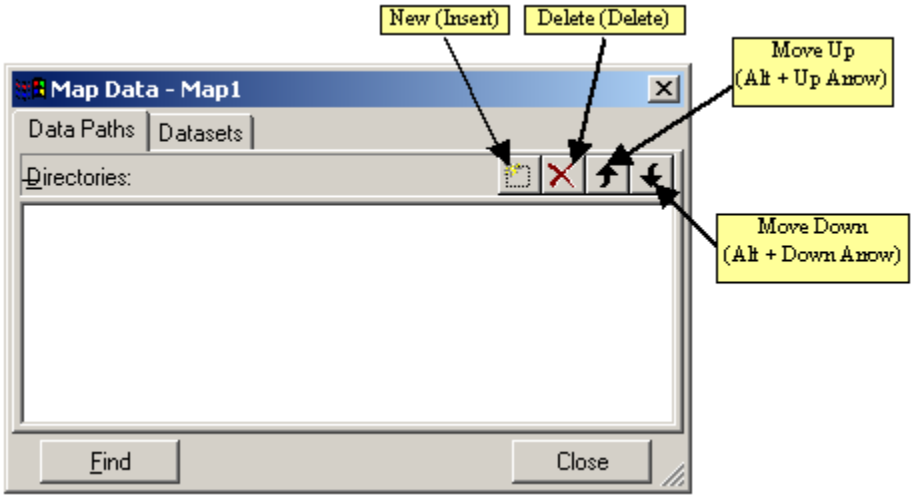


Figure 51. Map Data

a. Data Path Tab

The Data Paths tab contains the tools needed to make maps avalible to C2PC. The toolbar that is within the Data Paths tab allows the operator to create paths to maps, delete paths to maps, and move paths up or down.
To delete a path from the list under the **Data Paths** tab, select the path you wish to delete and click the **Delete** button from the toolbar (or click the **Delete** key from the keyboard). The path disappears from the list.

i. Construct a Map Data Path to a Known Location

1) Insert New Path

To add a new path to the list, click the **New (Insert)** button from the toolbar (Figure 52) (or click the **Insert** key from the keyboard) or double-click inside the directories window or after the line after the last path in the list. An input box with blinking cursor appears (Figure 53), and you may enter the path name directly into the box if you know it, like ***c:\maps***. You may also click ... (**Browse**) button that appears on the right side of the box to browse for a path. Using the browse method you should have a window like Figure 54.

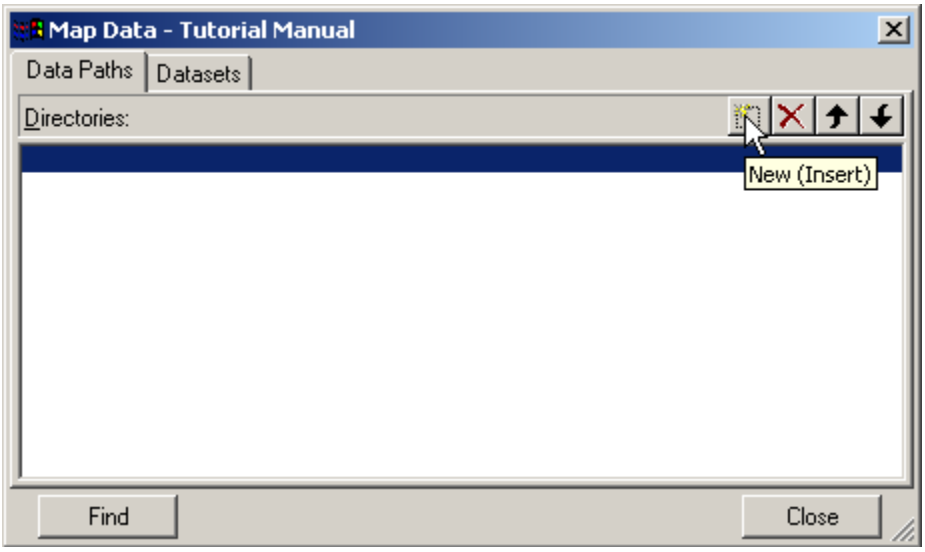


Figure 52. Creating a new path to a map

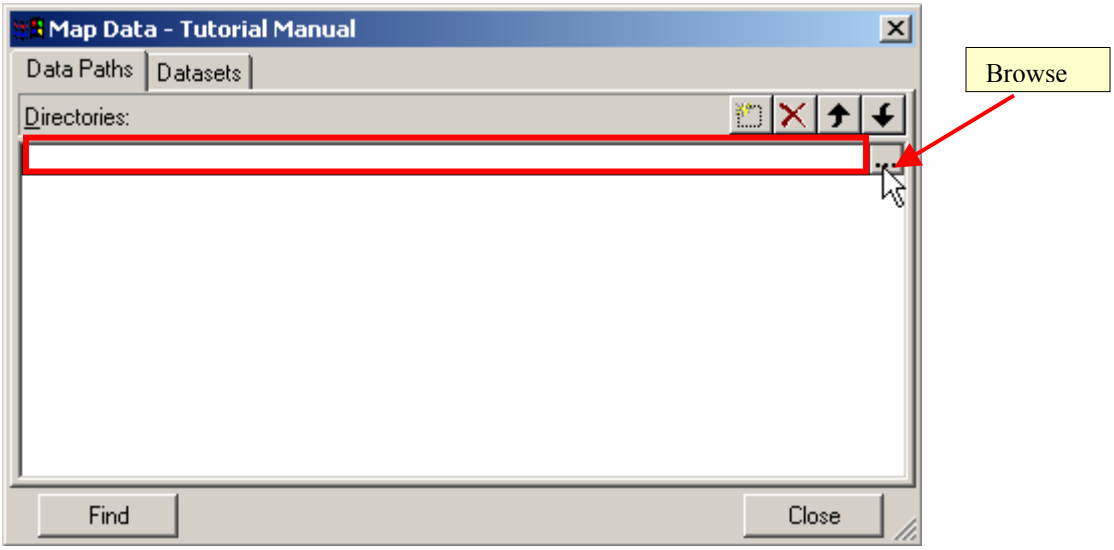


Figure 53. Browse for a map path

2) Browse For Map Data

You may enter the path directly or use the **Browse** button located at the right end of this text box (Figure 53). You need to know where the map or the desired imagery picture is located. This allows the user to locate maps and imagery using Windows Explorer look like window. In this case, the converted map is located in the Map directory. Using the mouse, the operator visually followed the path:

C:\Program Files\USMC\C2PCCL\data\Map\Adrg

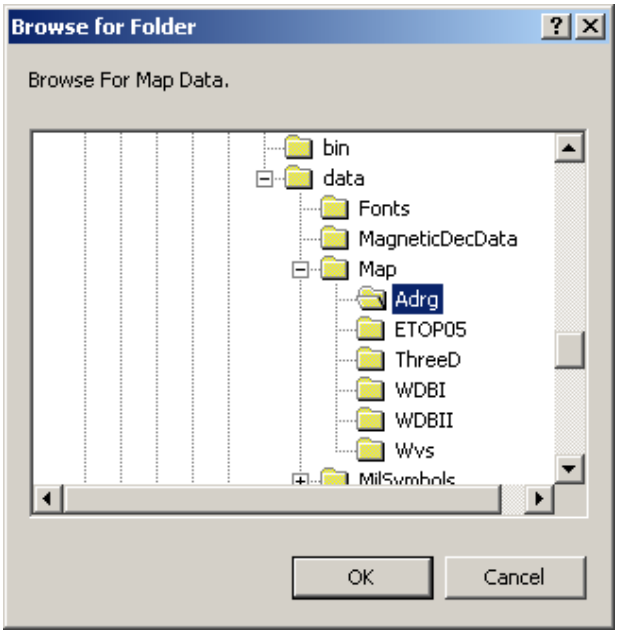


Figure 54. Browsing for map locations

Until you select a valid path the **OK** button will be inactive (unavailable). Once a valid path is selected, click **OK**. This auto-fills a directory path in the **Directories** window (Figure 55). It is also possible to create a path to another computer that is in the network and use those maps locally.

3) Confirm Data Path.

When the **OK** button is clicked, you are returned to the Map Data window, and the chosen path appears in the list in the **Directories** list (Figure 55).

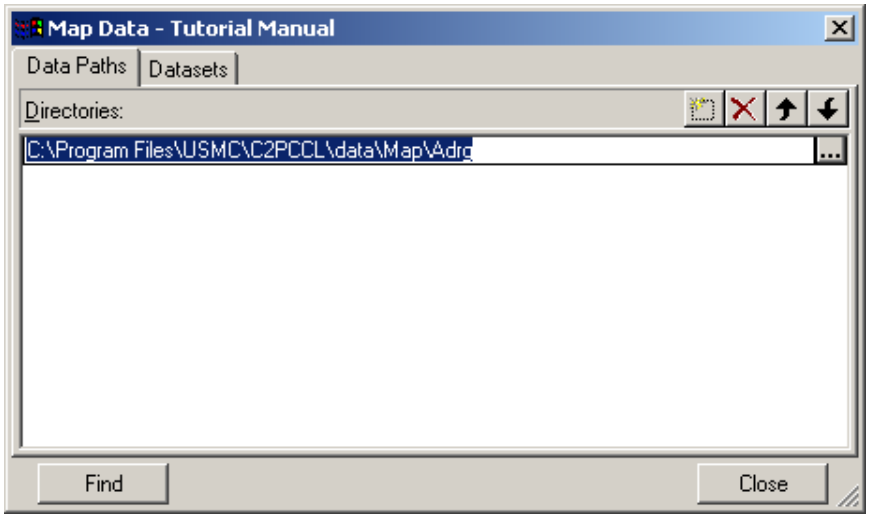


Figure 55. Chosen path loaded

Once the data path(s) has been created, select the **Datasets** (or **Maps**) tab to activate map coverage.

ii. Search for Map Data Paths

With this new version of C2PC (5.9.3), the feature of automatic searching for maps is available. This is very useful if you do not have an idea of the location of the maps. With the Find feature C2PC will look, search for valid digital map formats over your hard drive or network computers.

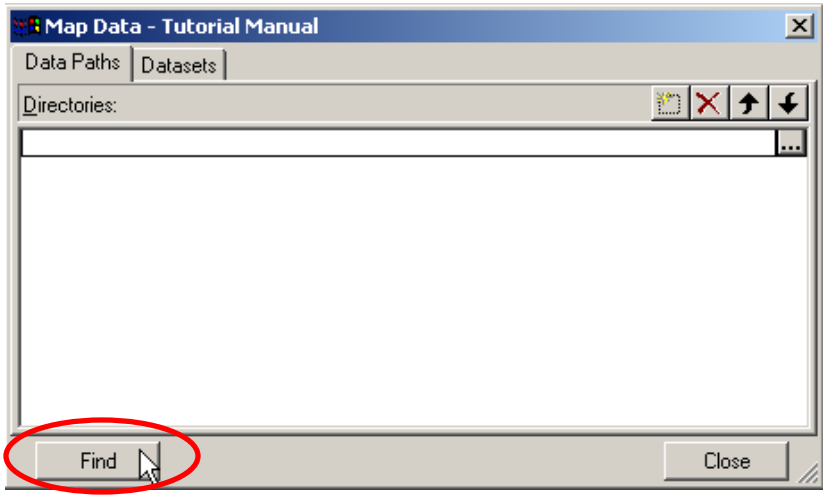


Figure 56. Find map data path

To search for map data on your hard drive or another location click the **Find** (Figure 56) button to display the **Find map data path** dialog box (Figure 57).

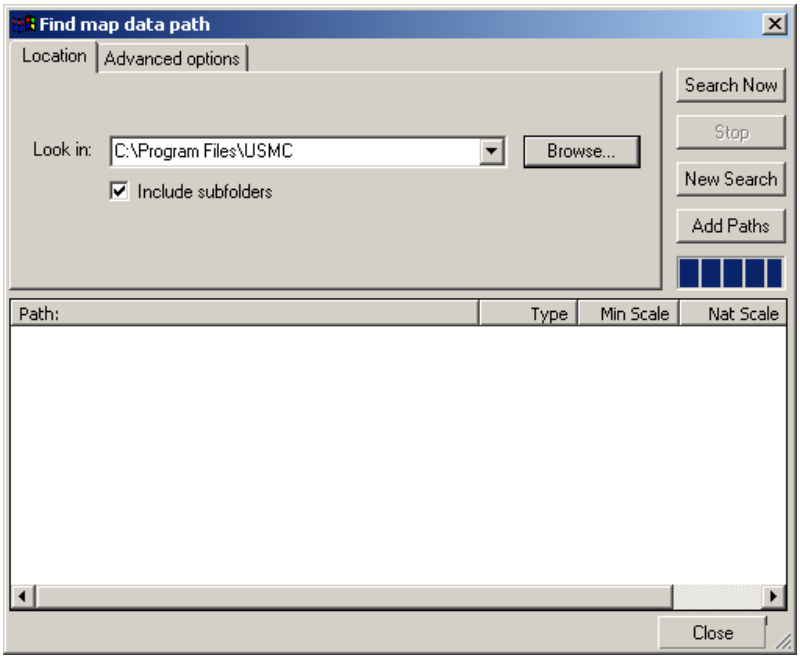


Figure 57. Find map data path window

In the **Look in** box, choose a disk drive or other location to search for map data. If you have an idea where the maps are located you could click the **Browse** button to choose the location such as another workstation on the network or an external disk drive for the search (Figure 57).

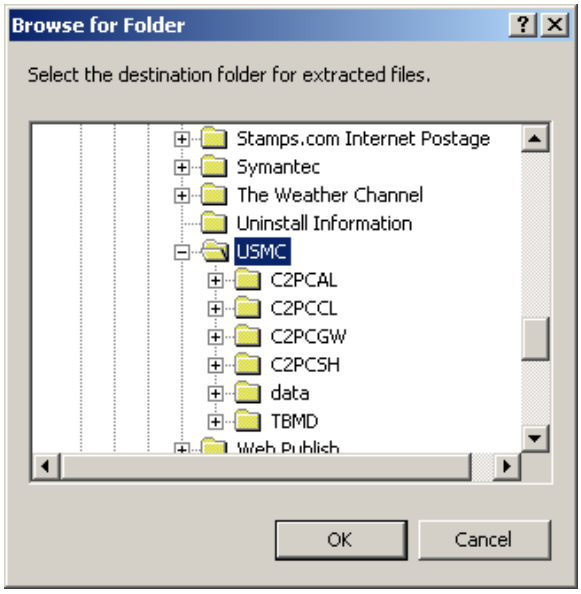


Figure 58. Browsing for map folders

Select a location in the Browse for Folder dialog box and click **OK.** The path to the desired directory will auto-fill in the **Look in** box (Figure 59). C2PC will start looking for maps in that directory.

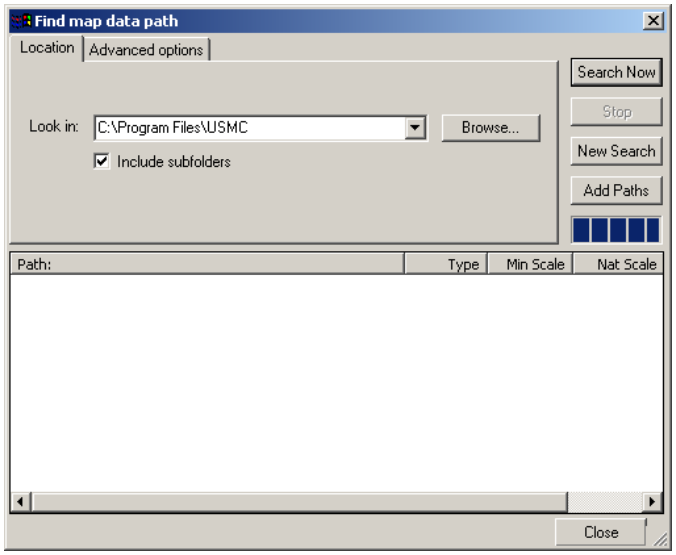


Figure 59. Searching for map paths

Select the **Include subfolders** checkbox if you want C2PC to search subfolders. Click the **Advanced Options** tab to view additional search options (Figure 60).

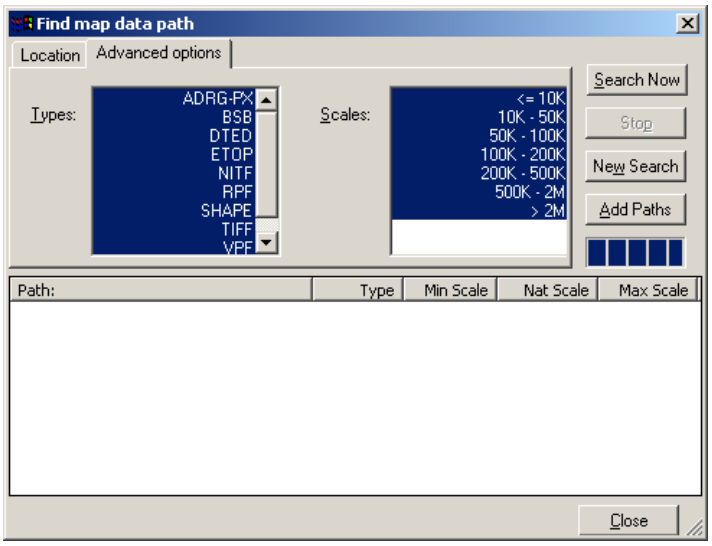


Figure 60. Find map data path advance options

Click the **Search Now** button to perform the search. When map data is found during a search, the path to that map data appears in the scroll box (Figure 61).

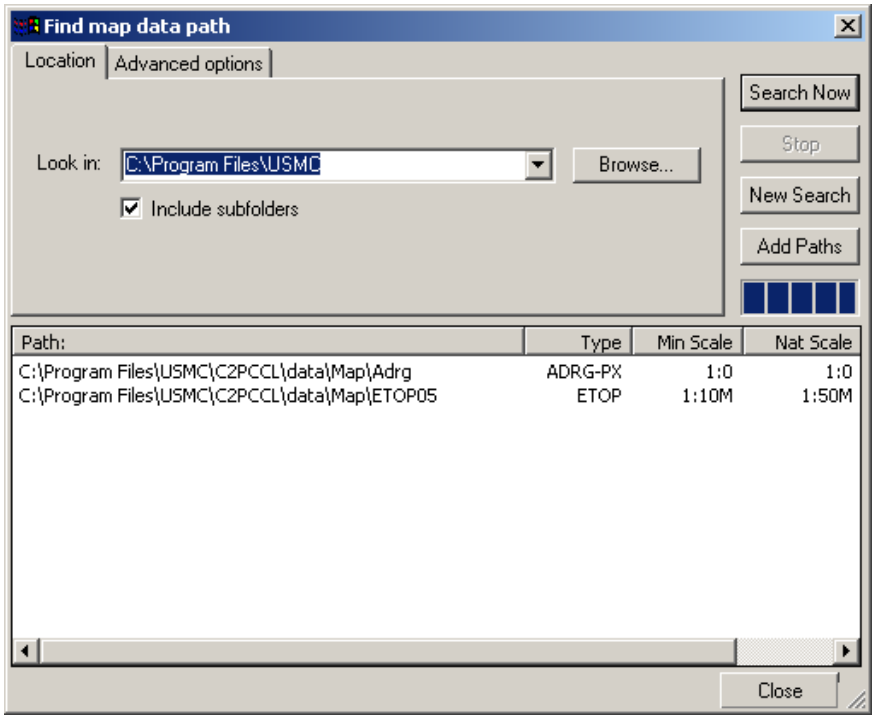


Figure 61. Map data path found after the search

To add a map path to the list in the Map Data window, select the path from the scroll list and click the **Add Paths** button (Figure 62).

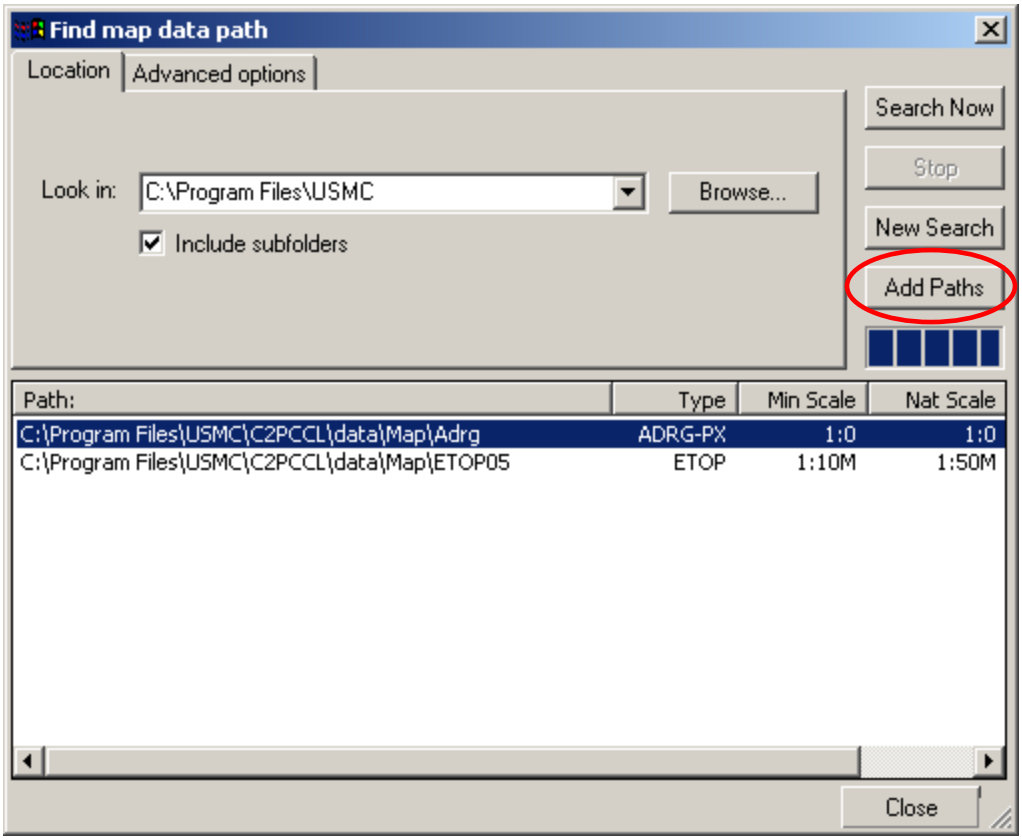


Figure 62. Selecting map data paths to be added to the current paths

NOTE: The **Ctrl** and **Shift** keys can be used in conjunction with the mouse click to select contiguous or non-contiguous items in the list.

Once the **Add Paths** button is clicked select **Close** to return to the **Datasets** tab (Figure 63).

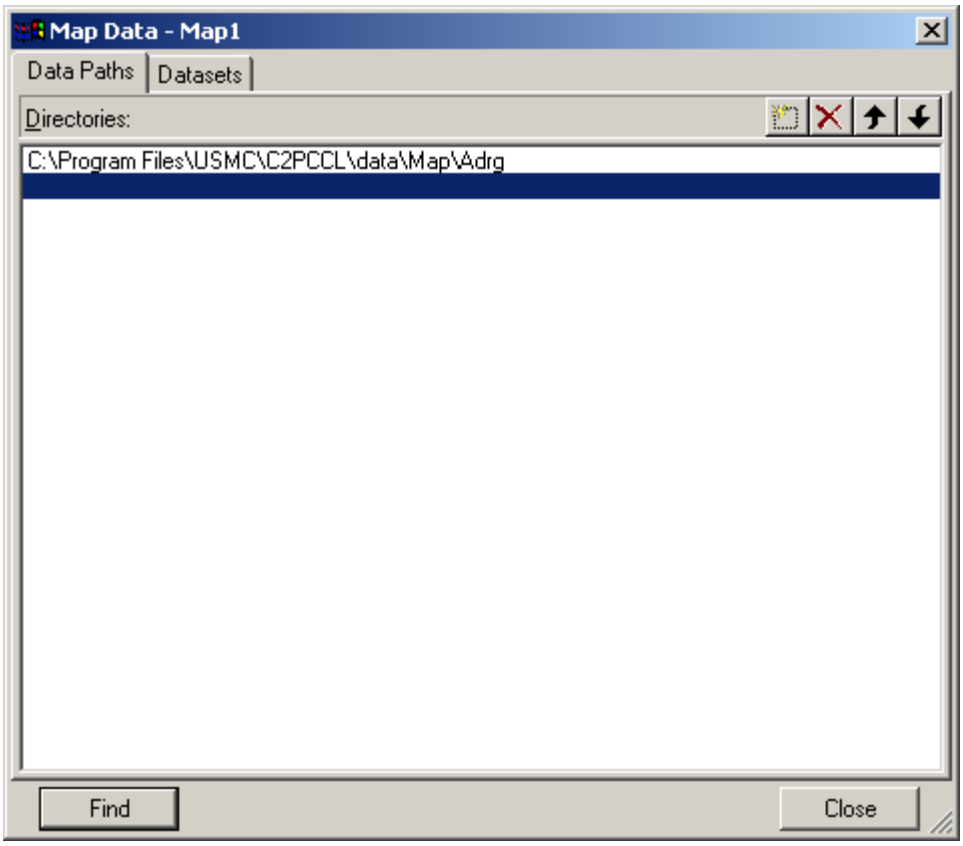


Figure 63. Added map data path from the search

Once the data path(s) has been created, select on the **Datasets** (or **Maps**) tab to activate map coverage.

b. Datasets Tab

If the **Map Data View Mode** toggle from **Defaults** tab in the C2PC Options window is set to **List View** (Figure 64), the **Datasets** tab is available (Figure 65). Click the **Datasets** tab to display additional information.

Figure 64. Map Data View Mode with List View option selected

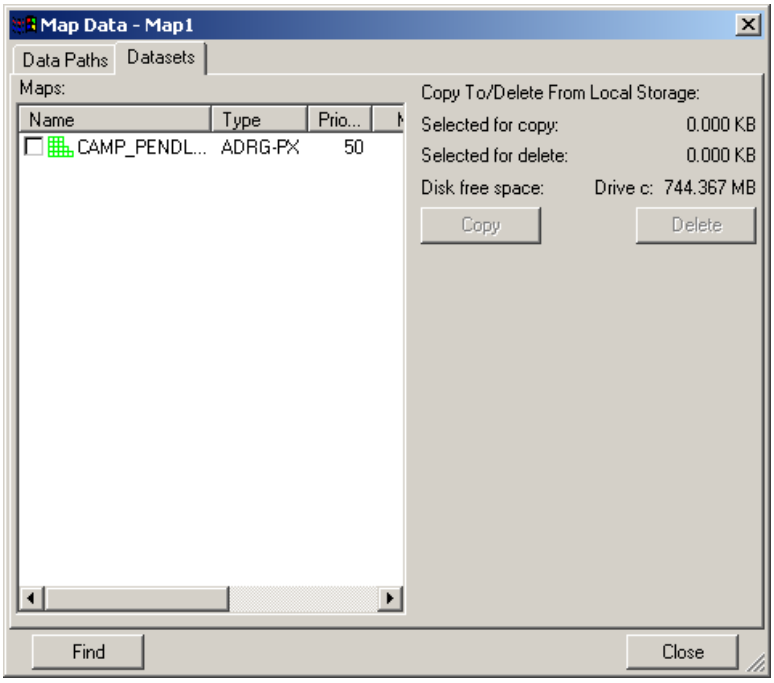


Figure 65. List of available maps under the List View option

The **Datasets** tab displays the list of available maps. Use this check box to activate, deactivate, and edit the maps. The check box shows the active/inactive state of the maps. Click any check box to turn on a map, or leave the check box blank to turn off a map. By double clicking on the name of a map, C2PC automatically will take you to the area of that map (Figure 66). Once you are finished, hit close.

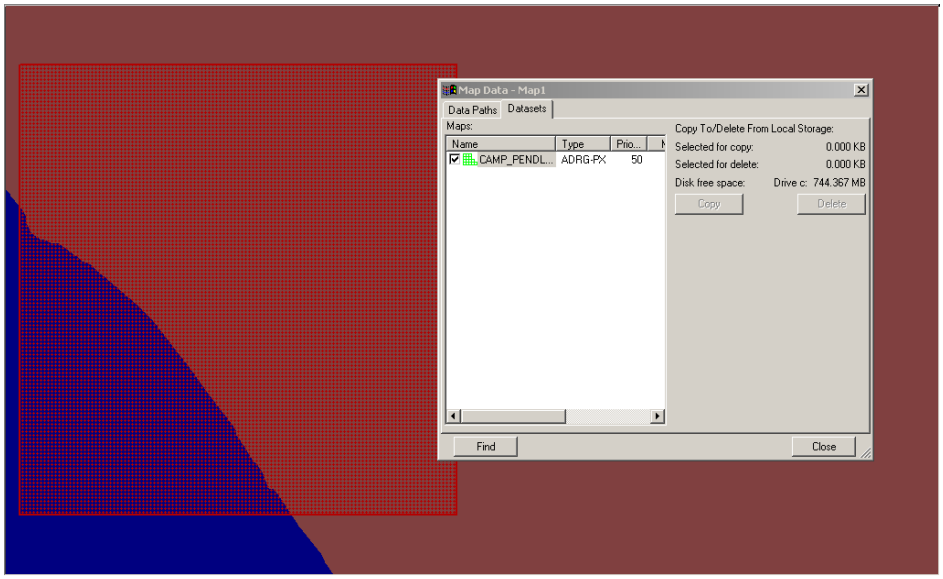


Figure 66. Activated maps

B. Working with maps

1. Zooming in on Digital Maps

The **Quick Draw** or **Zoom Box Flexible Draw** methods both zoom in on the active digital maps; however, each method works differently. The **Quick Draw** method uses the "next up" and "next down" buttons (Figure 67). The **Quick Draw** selection is located under the **Map** menu; this selection must be "checked" for the buttons to work. The Zoom Box method uses the **Zoom Box** selection with the Quick Draw selection unchecked.

Figure 67. The Move Quick Draw

Figure 68. Flexible Draw

The methods for viewing a raster map in the map window differ depending on whether you are in Quick Draw or Flexible Draw mode.

i. Quick Draw.

Viewing one scale of map at a time, thereby reducing the processor-intensive task of graphics rendering (drawing).

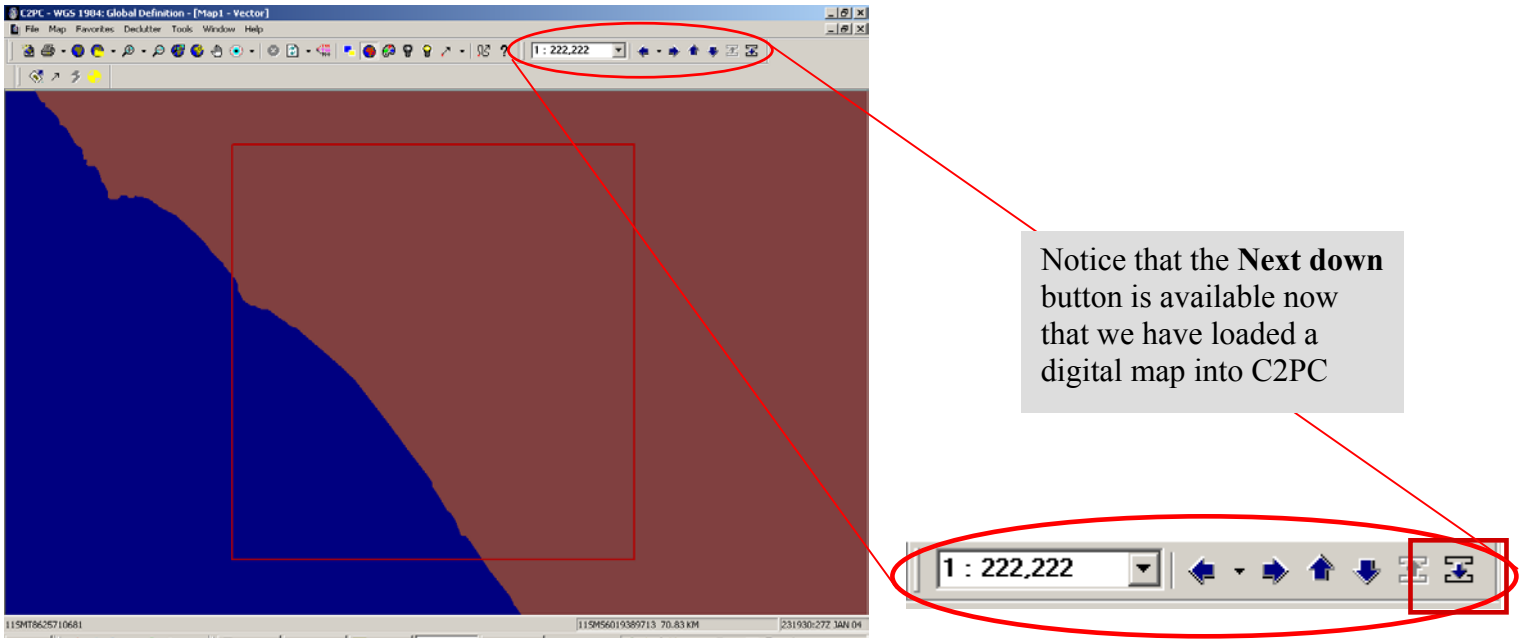


Figure 69. Bringing up a digital map

C2PC loads the maps in a layer format, from the highest scale to the lowest one. After you click the **Next down** button, C2PC loads the highest scale map available. In this case we only have one, a 1:50K map of Camp Pendleton. Notice that the Next up button now is available. You can go the previous scale map or next scale up map by clicking the **Next up** button. Figure 70 shows a map loaded into C2PC.

NOTE: The Quick Draw shows a map's size as a percentage and two buttons (Next up and Next down) that control the vector map view. Each time one of these buttons is pressed it will show either the next scale map down (or up, depending). In other words, the chart or vector map that is displayed when C2PC is started is the largest scale map. When the "next down" button is pressed the view will move to the next map in scale order.

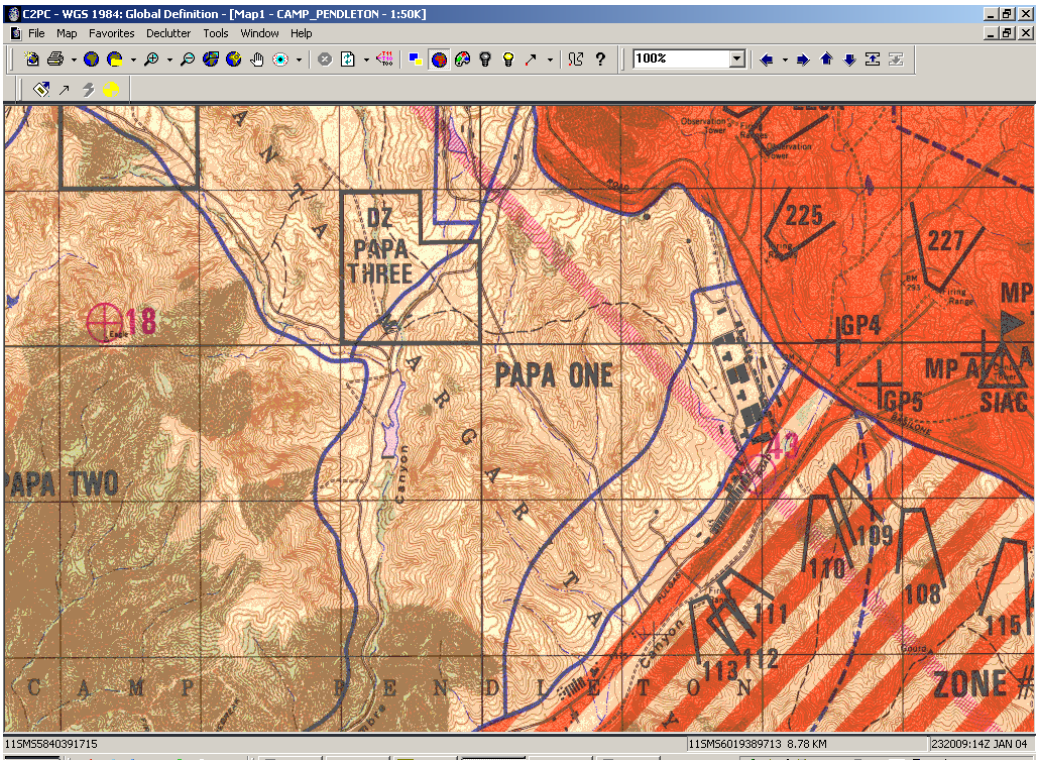


Figure 70. Digital Map loaded into C2PC

ii. Flexible Draw.

With **Flexible Draw** maps are redrawn slower. The Map: Projection option is available to allow to switch between maps. **Flexible Draw** causes the **Atlas** window to redraw **ALL** active map products each time the map display changes.

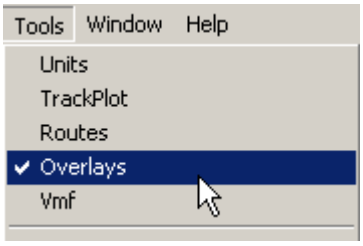
NOTE: Quick Draw is recommended

V. Using C2PC

C2PC has a variety of tools and features that can be employed from the creation of Overlays in support of courses of action development to Situational Awareness by providing you the Common Tactical Picture/Common Operational Picture.

A. Using Overlays

Choose the **Overlays** option from the **Tools** menu (Figure 71) to activate the **Overlays** feature. A new **Overlays** menu appear on the menu bar, containing options related only to Overlays. These menus include **Edit**, **View**, **Insert**, and **Overlays** (Figure 72). An **Overlay Toolbar** also appears below the main toolbar. When the **Overlays** option is selected, the **Overlays** tab is selected in the left portion of the map window and a list of all overlays in the system appears beneath the tab (Figure 73). Notice that C2PC follows the same structure as MS Windows to storage files.



NOTE: Similar changes in the Menu bar will occur with the other injectors.

Figure 71. Overlays Option from the Tools menu

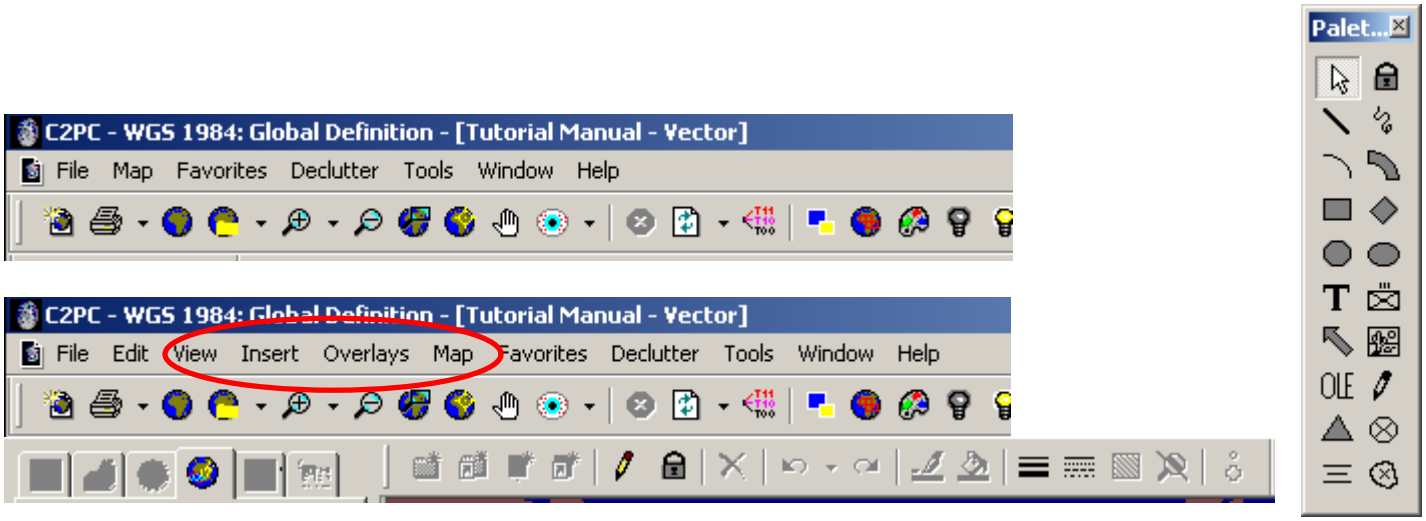


Figure 72. Changes in the Menu bar with the Overlays option selected, the Overlay toolbar and the Overlays Palette

Folders can hold other folders, multiple files, or a combination of folders and files. Files are comprised of operational graphics objects and groups of those objects. An overlay

object is any of the geometric shapes or objects located on the **Overlay Tools Palette** or **Insert** menu (Figure 72).

1. Overlay Folder

a. Creating a New Overlay Folder

To create a new folder within the Overlays list, select/highlight the target folder from the list (the location you wish to hold the newly created folder) (Figure 73), then choose the command to create a new folder within the selected folder. You can either create an overlay folder using the **Insert** menu bar (Figure 74) or the right click on top of the highlighted **Overlays Folder** then **New: Overlay Folder** (Figure 75).

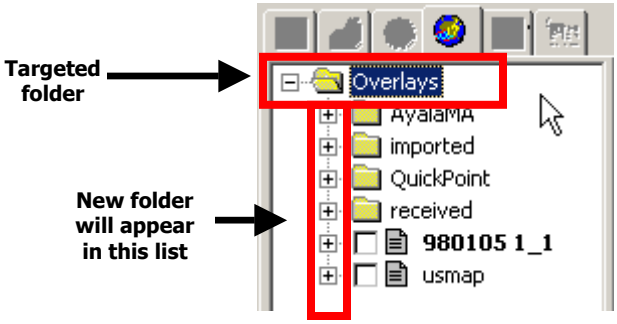


Figure 73. Overlay Folder

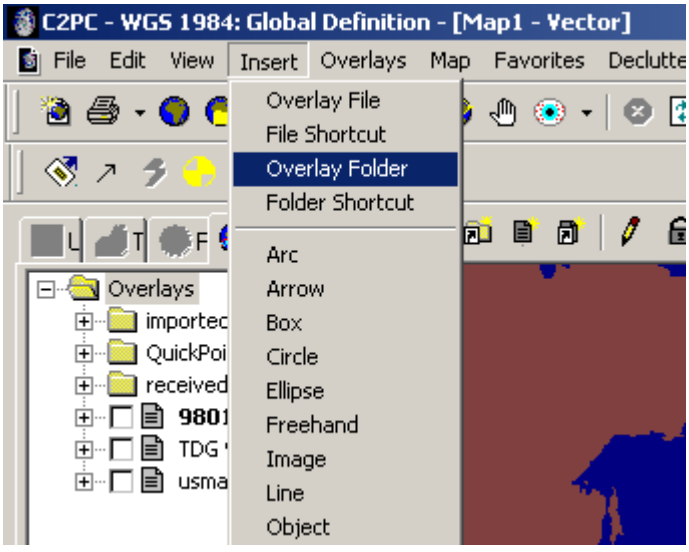


Figure 74. Inserting Overlay Folder using the Insert Menu

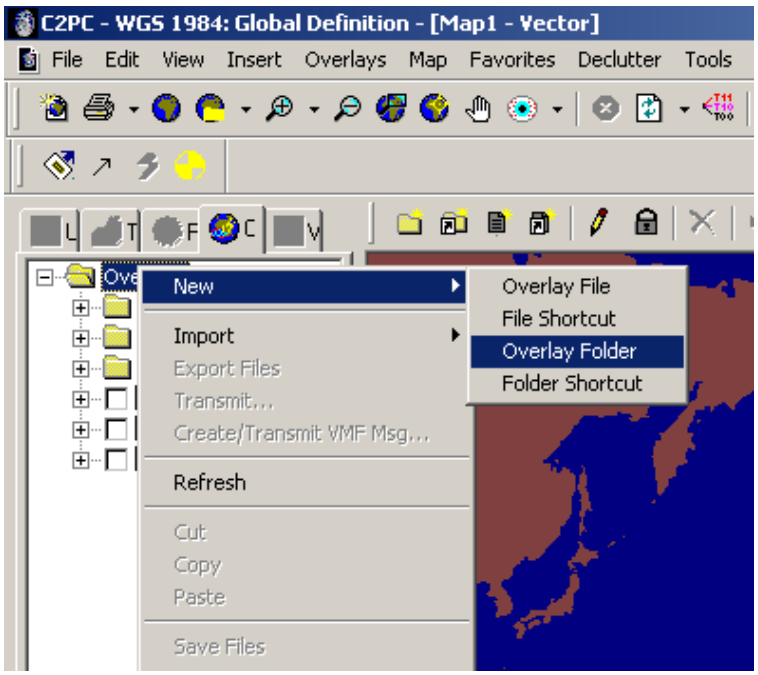


Figure 75. Inserting a new Overlay Folder using the right click of the mouse

The first new folder will be named **New Folder 1** by default, the second **New Folder 2**, etc (Figure 76).

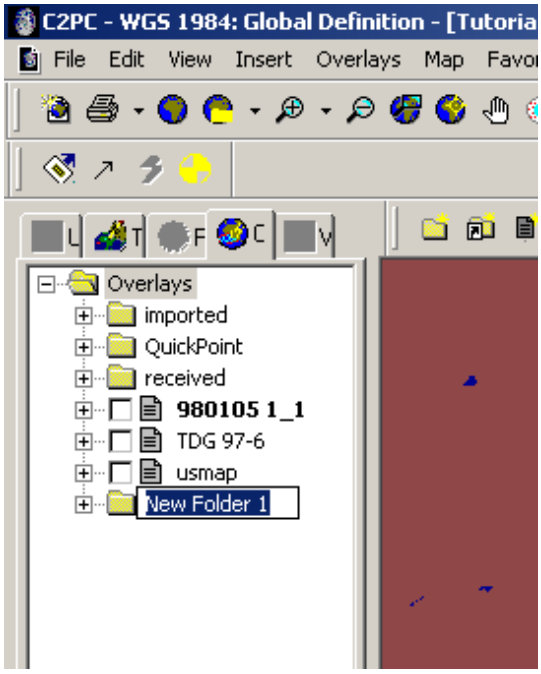
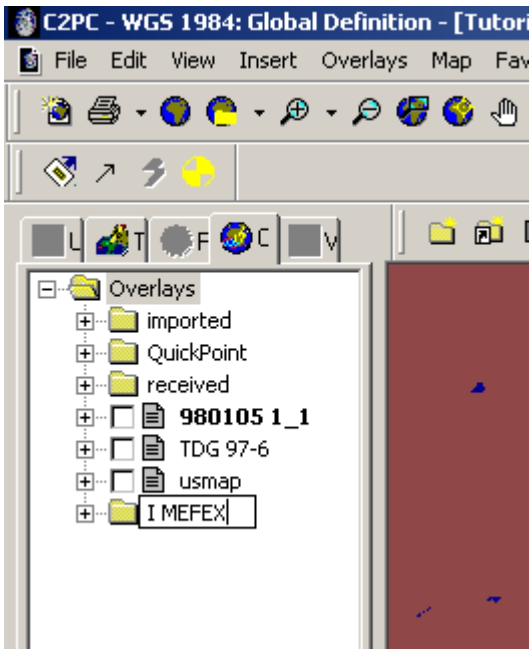


Figure 76. New Overlay Folder created

Type in the selected text box to rename the folder (Figure 77). Press **ENTER**.



NOTE: Check with your unit Standard Operating Procedures (SOP) to identify the standard naming convention for Overlays Folders and Overlays Files.

Figure 77. Naming the new Overlay Folder

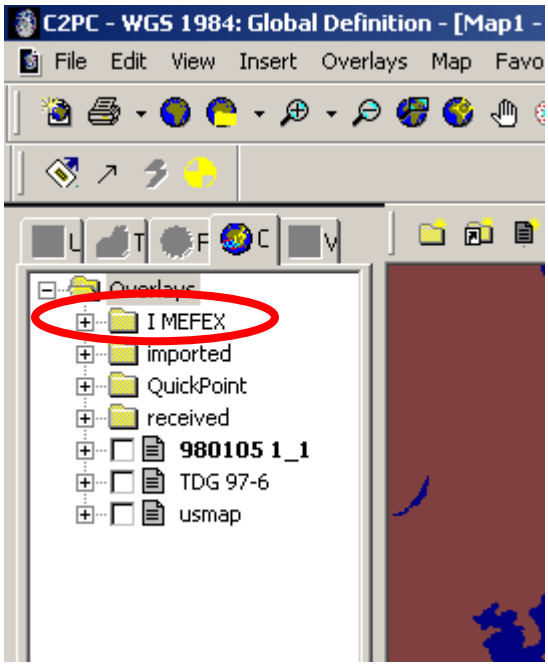


Figure 78. Newly Created Overlay Folder

The Overlays list will automatically sort into alphabetical order, with folders first and files on bottom (Figure 78).

2. Overlay Files

The **Overlay File** is the one that is going to hold all the Battlespace Geometry.
Files are comprised of overlay elements and groups of elements. An overlay element is any of the geometric shapes or objects located on the **Overlay Tools Palette** (or **Insert** menu), such as arrows, lines, boxes, and text.

a. Creating an Overlay File

Basically to create an overlay file you can follow the same procedure as to create an overlay folder. To create a new overlay file, right-click the target folder in the Overlays list, and then select **Overlay File** from the shortcut menu (Figure 79) or you can use the **Insert** menu (Figure 80).

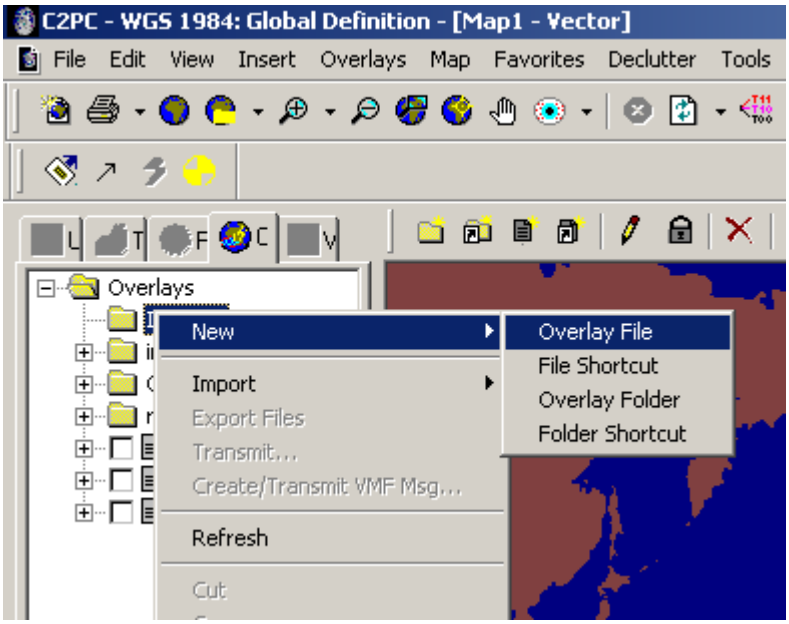


Figure 79. Creating an Overlay File using the mouse right click

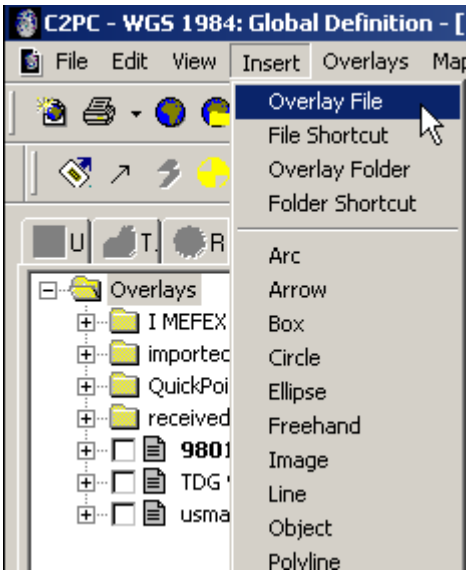


Figure 80. Creating an Overlay File using the Insert Menu

The first new overlay file will be named **New File 1** (by default), the second **New File 2**, etc. The new overlay file name will automatically be highlighted (Figure 81). Next, type in an intuitive name that represents the contents or purpose of the new file (Figure 81).

> **NOTE:** Check with your unit Standard Operating Procedures (SOP) to identify the standard naming convention for Overlays Folders and Overlays Files.

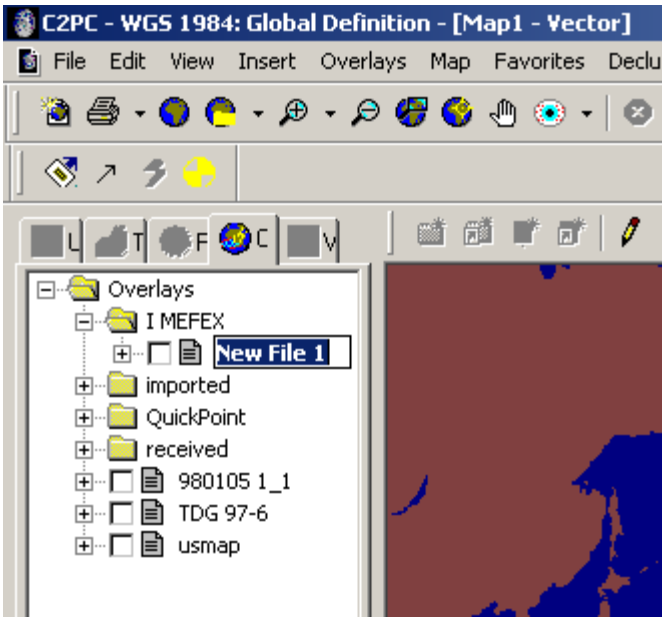


Figure 81. New Overlay File created

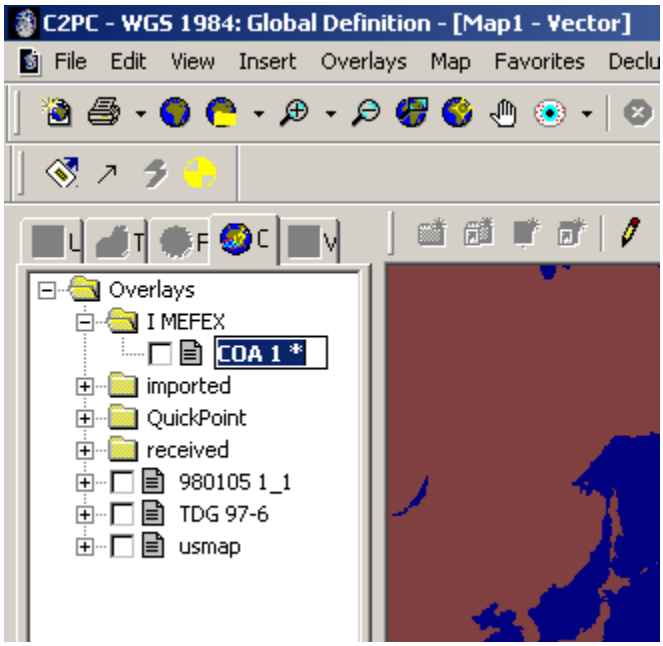


Figure 82. Naming the Overlay File

The new overlay file will display with an asterisk (*) to the right. This indicates that changes have been made to the file since it was last saved. Right-click the file name and select **Save** from the shortcut menu (Figure 83). The same can be accomplished by going to the **Overlays** Menu file and select the **Save** option.

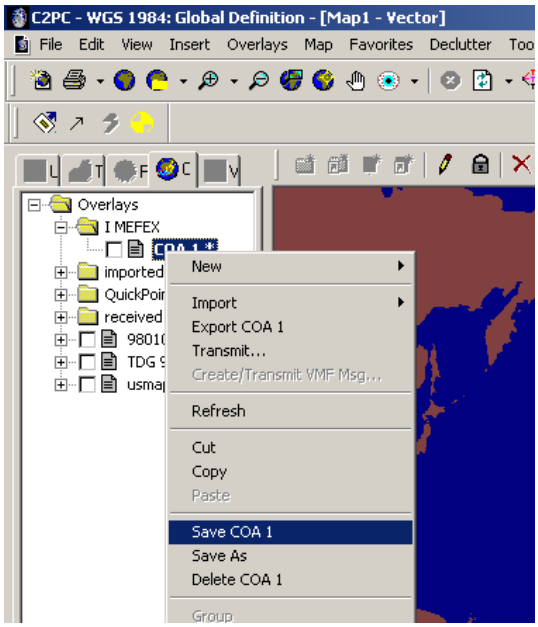


Figure 83. Saving the Overlay File

The same functionalities are found in the **Overlays** Menu Bar (Figure 84).

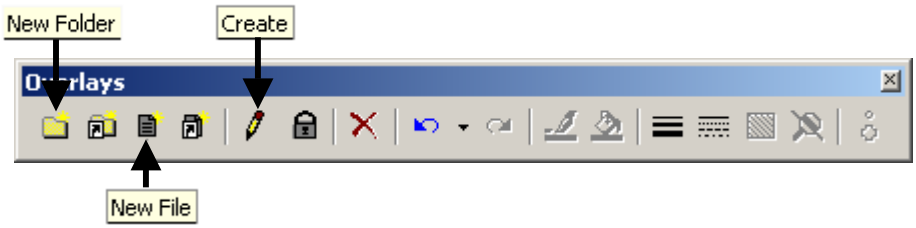


Figure 84. Overlays Menu Bar

b. Overlay Properties

To enter detailed information about the overlay file, double-click the overlay file or file name in the list to display the **File Input Data** dialog box (Figure 85). (Alternately, you can also select the file in the list and choose the **Properties** command from the **Overlays** menu or from the right-click shortcut menu in the overlays list to display this dialog box.)

The File Input Data dialog box contains four tabs, with the **Identifiers** tab being the default tab.

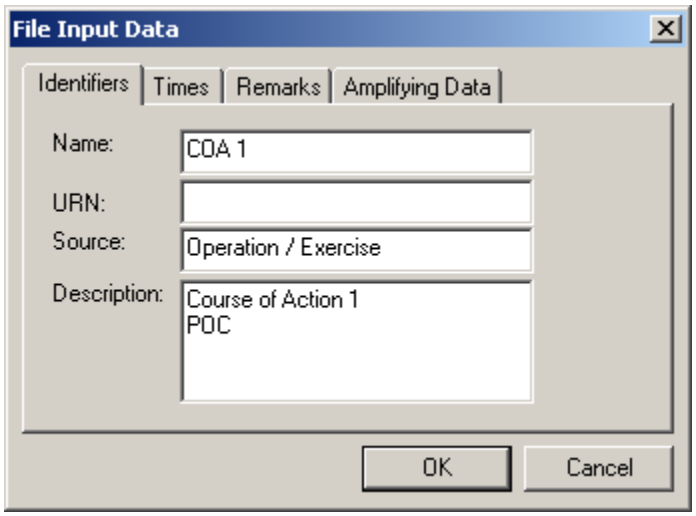


Figure 85. Overlay File Input Data

i. Identifiers Tab

Figure 85 shows the **Identifiers** tab. The corresponding text boxes are discussed below.

1) Name
   Enter a name for the overlay. When this box is changed, the new name will appear in the overlays list after **OK** is clicked for the **File Input Data** dialog box.
2) Source
   Enter the name of the local command.
3) Description
   Enter a brief description of the overlay.

ii. Times Tab

Figure 86 shows the **Times** tab. The corresponding text boxes are discussed below.

1) Created
   Displays the DTG when the overlay was created. This box cannot be edited.
2) Modified
   Displays the DTG when the overlay was most recently modified. This box cannot be edited.
3) Start DTG
   Enter the start date when the overlay is effective.
4) End DTG
   Enter the end date when the overlay is effective.

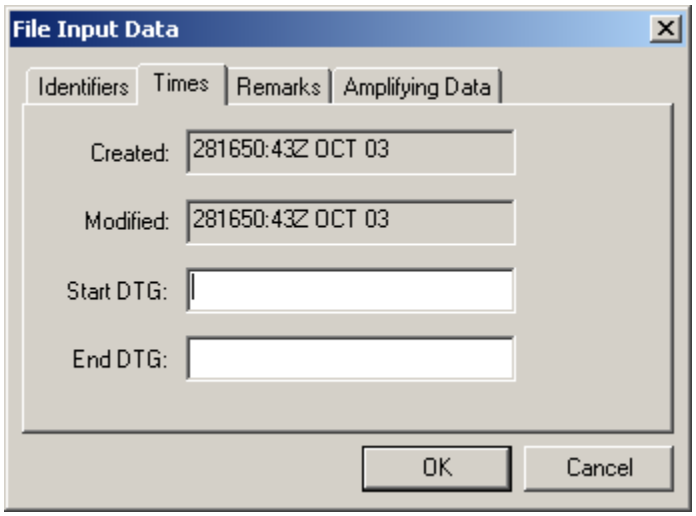
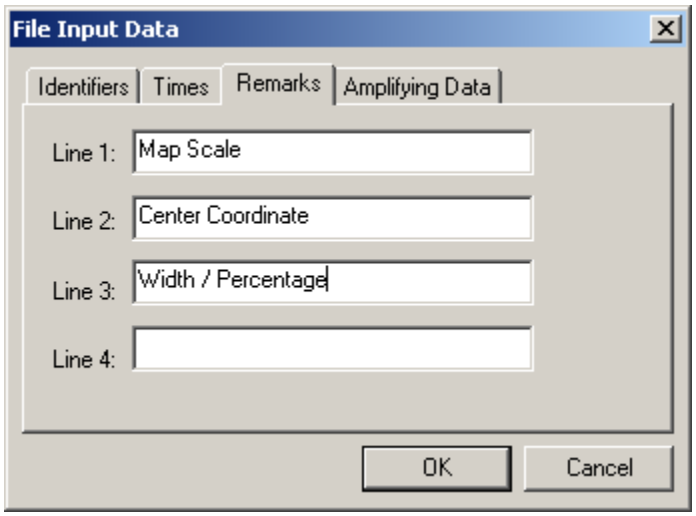


Figure 86. Times Tab

iii. Remarks Tab: Line 1 - Line 4

Four lines are provided to enter freeform text remarks about the overlay (Figure 87). Some suggestions are provided like map scale use, the center coordinate of your map and the width or percentage used.



NOTE: These are suggestions. The Map Scale, Center Coordinate, Width, and Percentage (Zoomed in) can be entered into these textbox so when we share this overlay with another C2PC user, that person can duplicate exactly the same view as the originator of the overlay.

Figure 87. Remarks Tab

iv. Amplifying Data Tab

The **Amplifying Data** page contains an area for entering any freeform text about the overlay. Enter any text that you want about the overlay and click **OK** to accept the new entry, Figure 88.

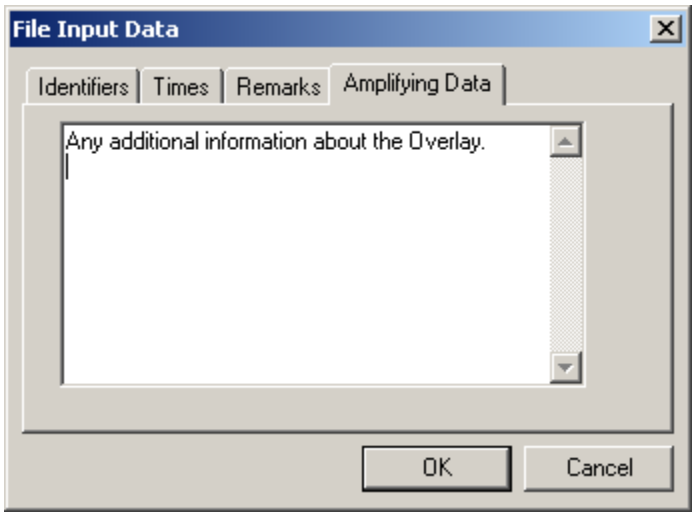


Figure 88. Amplifying Data

When you finish entering information into the boxes in the **File Input Data** dialog box, click **OK** to save the overlay. The overlay appears in the list under the **Overlays** tab in the left pane of the map window. Note that the overlay is not permanently saved until it is saved from the overlays list with the **Save** command from the **Overlays** menu or with the right-click shortcut **Save** command.

3. Adding Graphics to the Overlay

An overlay consists of graphic objects, which can be displayed in the map window.

Before adding objects to an overlay, you must select an overlay from the overlay list. The new object will be placed in that overlay. There are three ways to add graphics object to an overlay:

- Tools Palette
- Insert Menu
- Overlay Toolbar Menu

Use commands under the line in the **Insert** menu (Figure 89), the **Tools Palette** (Figure 90), or the **Overlays Toolbar Menu** (Figure 91) to add overlay objects to an existing overlay. The Tools Palette contains tools for adding 18 different types of overlay objects, as well as a Select tool and a Lock tool.

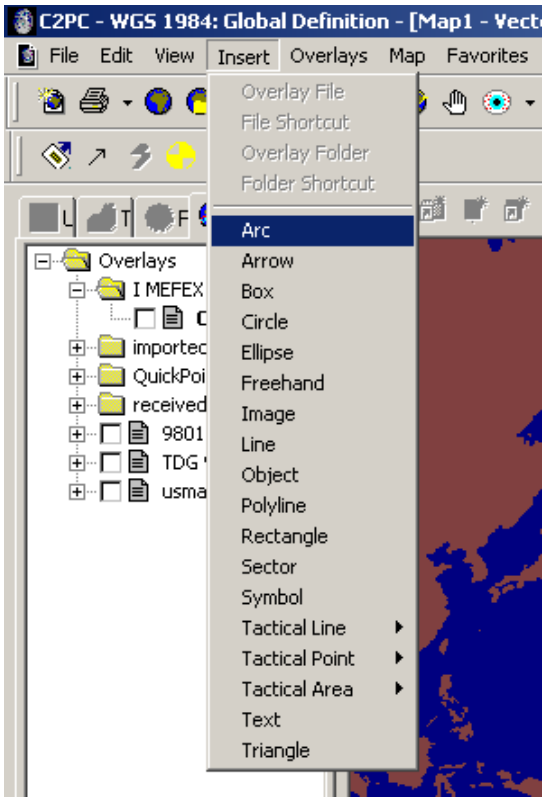


Figure 89. Inserting graphics using the Insert Menu Bar

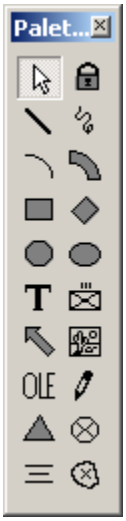


Figure 90. Inserting Graphics using the Tools Palette

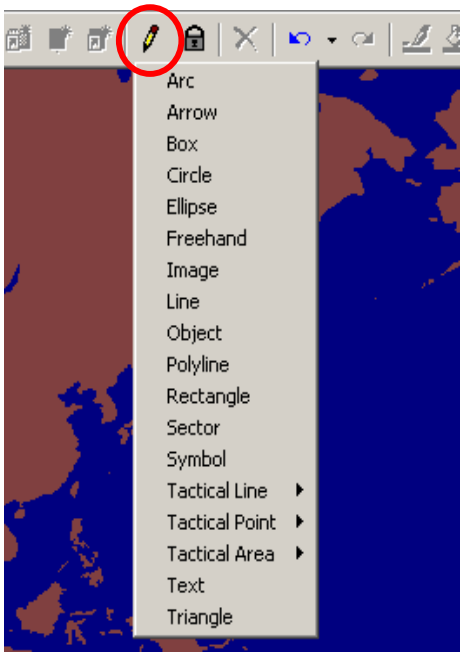


Figure 91. Inserting graphics using the Overlays Toolbar Menu

The **Tools Palette** contains tools for adding different types of overlay objects.

a. Line

Use the **Line** tool to create a line. To draw a line in the map window:

- Select the **Line** tool on the **Tools Palette**, from the **Insert** menu or **Overlay** toolbar.
- In the map window, left click and while keeping the left button of the mouse pressed drag to create a line. Release the left button of the mouse when done.

To edit a line already drawn in the map window:

- Click the **Select** tool from the **Tools Palette** or basically select the name of that line from its respective overlay file.
- Click the line in the map window to select it. When selected, little white squares appear at the center point and at both ends of the line.
- Drag either endpoint to stretch or compress the line. Drag the center point to move the entire line to a new location.

Another way to edit a line is to double-click the line in the map window, double-click the line object in the overlay list, or select the line and choose the **Properties** command from the **Overlays** menu to display the **Line Input Data** dialog box (Figure 92).

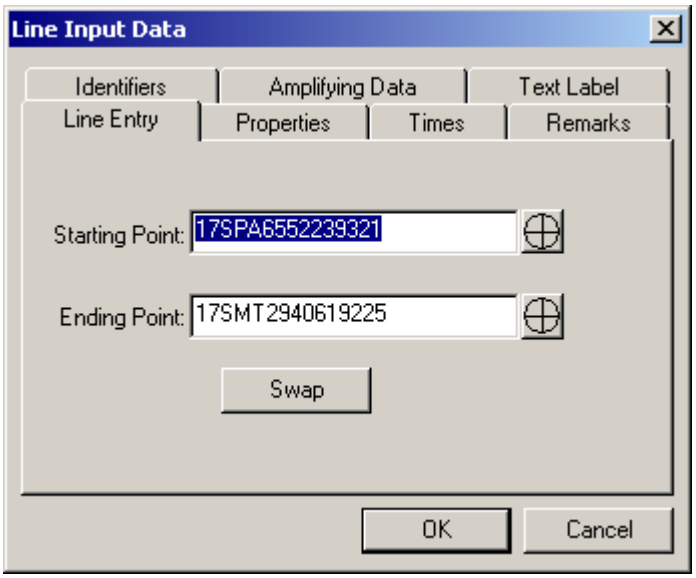


Figure 92. Editing Line Data

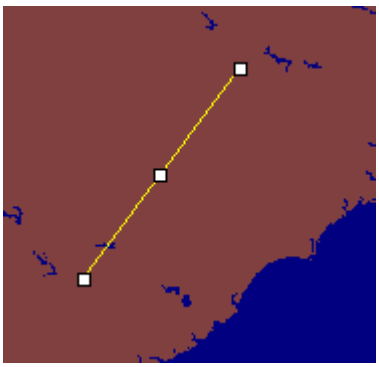


Figure 93. Line graphic object

The **Line Entry Tab** is the default tab. The following boxes are displayed:

- **Starting Point:** Enter or edit the starting position point of the line.
- **Ending Point:** Enter or edit the ending position point of the line.

Click the **Swap** button to switch the starting and ending points. This is useful when the line style has an implied direction, such as a cold front.

NOTE: The **Properties**, **Times**, **Remarks**, **Identifiers**, **Amplifying Data**, and **Text Label** tabs contain boxes that are the same for many of the overlay objects. Those tabs will be discussed at the end of this section.

b. Polyline

Use the **Polyline**  tool to create a group of connected line segments. These line segments can be closed to form a polygon or left open as a multi-segmented line.

To draw a polyline in the map window:

- Click the **Polyline** tool from the **Tools Palette**, or choose **Polyline** from the **Insert** menu.
- In the map window, left click an endpoint for the polyline.
- Move the cursor and left click to create a line between the previous endpoint and the new endpoint.
- Continue to left click additional points for the polyline.
- When finished, move the cursor to the **Tools Palette** and click the **Select** tool or double-left click in the map window.

To edit a polyline already drawn in the map window:

- Click the **Select** tool  .
- Click the polyline to select it. The endpoints of the polyline segments become little white squares when selected.
- Drag any endpoint to a new location.

Another way to edit a polyline is to double-click the polyline in the map window, or double-click the polyline object in the overlay list, or select the polyline and choose **Properties** from the **Overlay** menu to display the **Polyline Input Data** dialog box (Figure 94).

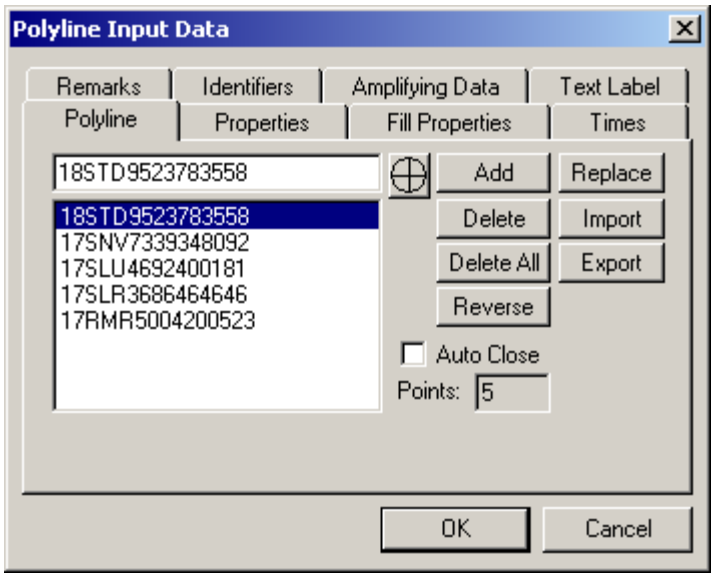


Figure 94. Polyline Input Data

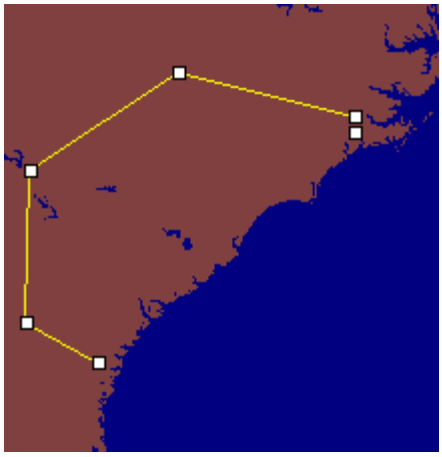


Figure 95. Polyline graphic object

The **Polyline Input Data** dialog box contains seven tabs to allow you to enter different information about the polyline and to change the properties. The **Polyline** tab is the default tab and displays the following boxes:

- **Polyline Endpoints Scroll List:** The endpoints of the polyline are displayed in the white box in the left pane of the window. To change the order of any of the endpoints in the scroll list, you may drag an endpoint to a new location in the list.
- **Add:** To add a new endpoint to the polyline, select a point in the scroll list, enter the position for the point in the box above the scroll list, and click the **Add** button. The new point is inserted after the selected point in the list. To enter a position in the box, you may enter the position from the keyboard or click the crosshairs button and click a point in the map window to automatically enter the position into the box. The new endpoint will not appear in the map window until the **OK** button is clicked for the **Polyline Input Data** dialog box.
- **Delete:** To delete an existing polyline endpoint, select a point in the scroll list and click the **Delete** button. The point is removed. The polyline will not be updated in the map window until the **OK** button is clicked for the **Polyline Input Data** dialog box.
- **Delete All:** To delete all the endpoints for the polyline, click the **Delete All** button. All points are removed from the list. The polyline will not be updated in the map window until the **OK** button is clicked for the **Polyline Input Data** dialog box.
- **Reverse:** Click the **Reverse** button to reverse all the endpoints in the list.

- **Replace:** To replace an existing polyline endpoint, select a point in the scroll list, enter the position for the point in the box above the scroll list, and click the **Replace** button. The new point is inserted in place of the selected point in the list. To enter a position in the box, you may enter the position from the keyboard or click the crosshairs button and click a point in the map window to automatically enter the position into the box. The new endpoint will not appear in the map window until the **OK** button is clicked for the **Polyline Input Data** dialog box.

c. Arrow

Use the **Arrow**  tool to create an arrow symbol in the map window. The arrow symbol is often used to represent a direction of planned movement. To draw an arrow symbol in the map window:

- Click the **Arrow** tool on the **Tools Palette**, or from the **Insert** menu.
- In the map window, left click an endpoint for the pointing end of the arrow (Your destination).
- Move the cursor and click to create a line between the previous endpoint and the new endpoint.
- Continue to click additional points for the arrow.
- When finished, double left-click in place.

To edit an arrow already drawn in the map window:

- Click the **Select** tool  .
- Click the arrow to select it. The endpoints of the arrow become little white squares when selected.
- Drag any endpoint to a new location.

Another way to edit an arrow is to double-click the arrow in the map window, double-click the arrow object in the overlay list, or select the arrow and choose **Properties** from the **Overlays** menu to display the **Arrow Input Data** dialog box (Figure 96).

NOTE: When creating an arrow, you start drawing it from the pointing tip of the arrow, in other words, your destination. You can left click to add more points to your arrow while working your way to the end of the arrow or your point of origin in the movement.

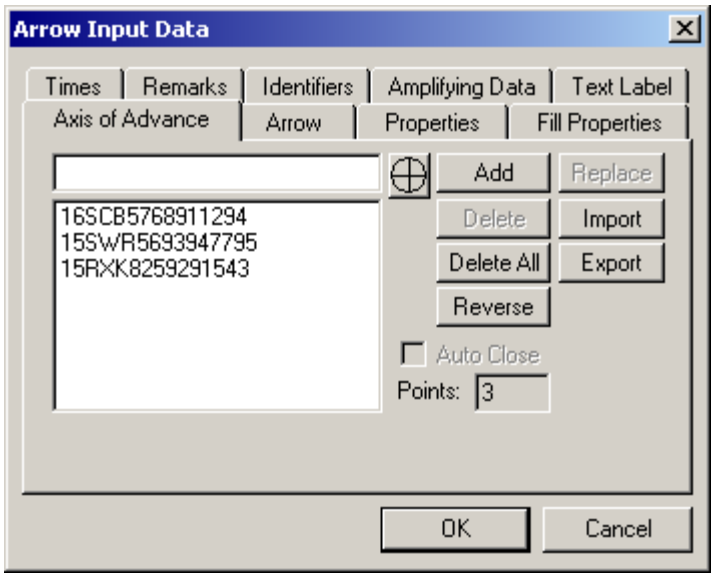


Figure 96. Arrow Input Data

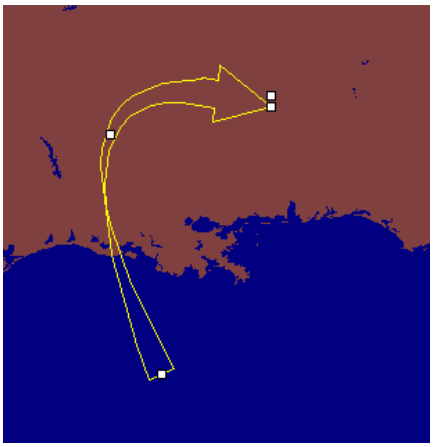


Figure 97. Arrow graphic object

The **Arrow Input Data** dialog box contains eight tabs to allow you to enter different information about the arrow and to change the appearance. The **Axis of Advance** tab is the default tab and displays the same boxes as the **Polyline** tab described previously.

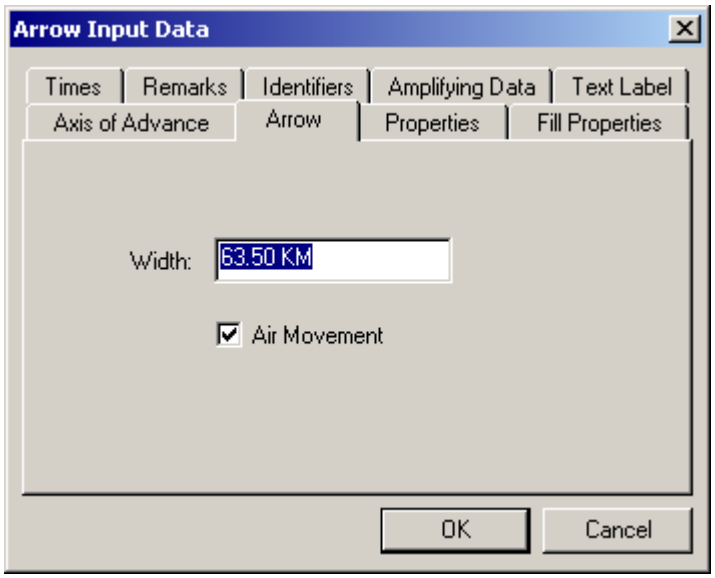


Figure 98. Arrow Tab

NOTE: A minimum of three points is required for the feature of Air Movement to work properly.

By selecting the **Arrow** tab you has the following options:

- **Width:** Enter the width for the arrow. This will represent the width of your movement.

- **Air Movement:** Select this check box if this arrow represents an air corridor movement. When this is checked, the arrow displays with a twist at the approximate center-point along the designated path. Note that a minimum of three points is required for this feature to work properly.

d. Object (OLE)

Sometimes we have intelligence pictures that can be used in support of a course of action or we have the narrative of that course of action in a Microsoft Word document. You can embed those kinds of objects into C2PC.

Use the **OLE** OLE tool to embed an object as part of the overlay. Many different types of objects can be embedded into the C2PC map window. For example, Microsoft Word files, Wave Sound files, and Bitmap Image files can all be inserted into the map window.
To insert a file, perform the following steps:

- Click the **OLE** tool OLE (or choose **Insert: Object**).
- In the map window, click the area where the file is to appear. An OLE symbol appears in the map window at the chosen spot and the Insert Object window appears.

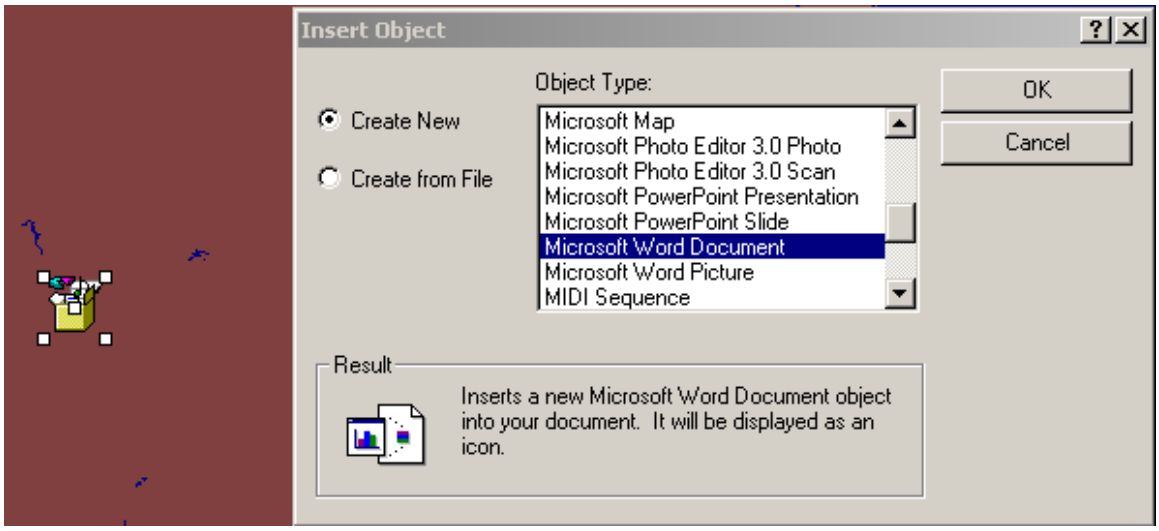


Figure 99. Inserting an OLE Object

Figure 100. MS Word Document embedded into C2PC Overlay

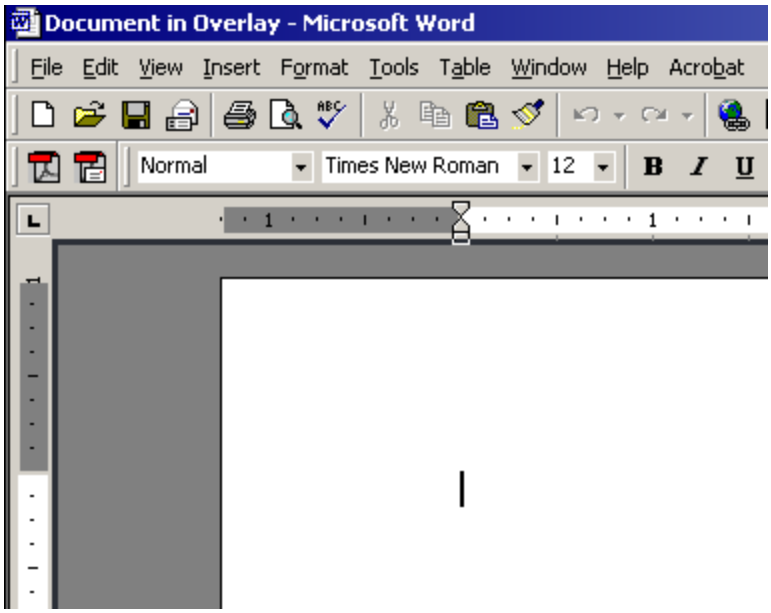


Figure 101. Embedded C2PC MS Document opened in MS Word

NOTE: By double clicking the MS Word document icon, it will open up MS Word and you will be able to edit the content of the document (Figure 102).

- Select an object type from the scroll list.
- Click either the **Create New** or **Create From File** radial button. If the **Create New** radial button is selected, a new file of the type selected will be inserted into the map window. If the **Create From File** radial button is selected, you must enter a pathname or use the **Browse** button to choose a file that has already been created to import into the map window.

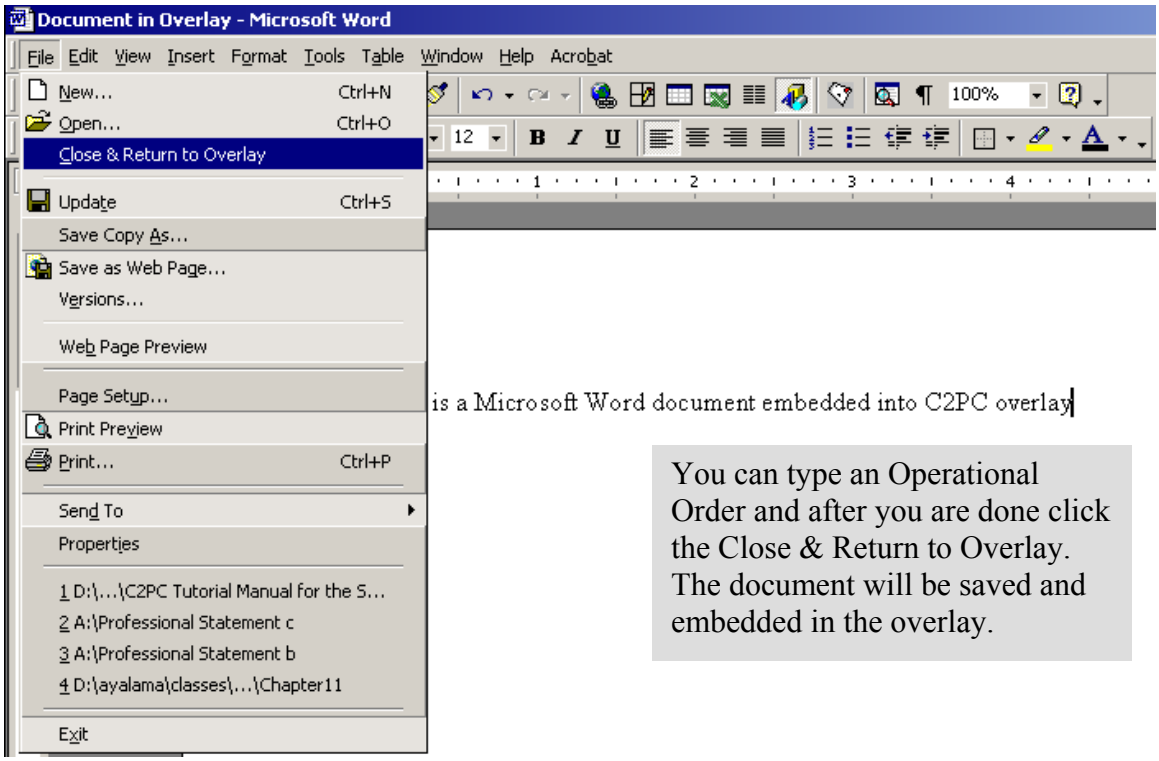


Figure 102. Microsoft Word document opened within C2PC

NOTE: When a file is associated with an OLE object, you may double-click the OLE symbol in the map window to open the file.

To edit an **OLE** object double-click the **OLE** object in the overlay list or select the OLE object and use the **Overlays: Properties** option to display the **Ole Input Data** window.

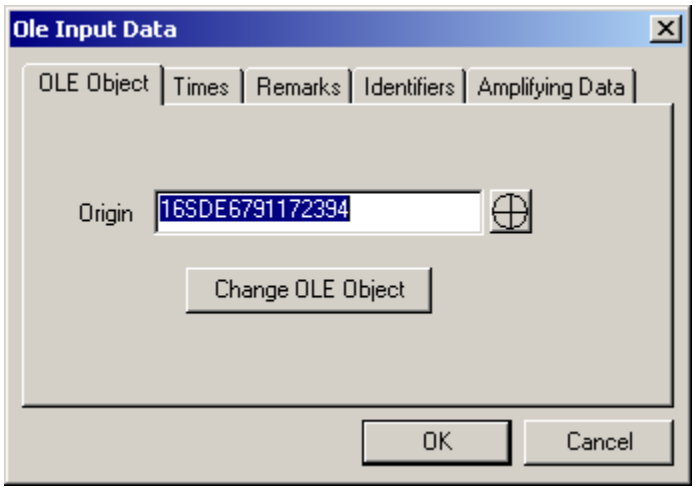


Figure 103. OLE Input Data

The **OLE Input Data** window contains five tabs to allow you to enter different information about the OLE object. The OLE Object tab is the default tab and displays the following field.

- **Origin:** Enter the position of the center point of the OLE object.
- **Change OLE Object:** Click this button to change the OLE object to a new OLE object. When this button is clicked, the Insert Object window appears to allow you to choose a new OLE object.

e. Symbol

C2PC provides a variety of symbols to represent units in the battlefield. Use the **Symbol**  tool to plot a symbol in the map window. To plot a symbol in the map window:

- Click the **Symbol** tool  (or choose **Insert: Symbol**).
- In the map window, click the area where the symbol is to appear. A symbol appears in the map window at the chosen spot. A little white square appears in the center of the symbol. Drag this square to move the symbol to a new location.
- To change the symbol to the symbol that you want, double-click the symbol in the map window, or double-click the symbol object in the overlay list, or select the symbol and right click and select **Properties** to display the **Symbol Input Data** window (Figure 104).

When in **NTDS** mode, The **Symbol Input Data** window contains six tabs to allow you to enter different information about the symbol. When in **MIL-STD-2525** mode, the **Symbol Input Data** window contains seven tabs. We will discuss the MIL-STD-2525 only.

The Symbology tab appears when in MIL-STD-2525 mode only and is the default tab. The following fields of information appear under the Symbology tab:

- **Mil2525 Code:** The **Mil2525 Code** is a code that is automatically generated based on values chosen for the **Affiliation**, **Size**, and **Function Id** fields. This field cannot be edited.
- **Affiliation:** This displays the currently selected affiliation. To select a different affiliation, click the down arrow and choose an affiliation from the displayed choices. The affiliation determines the shape and color of the symbol in the map window (Figure 104).

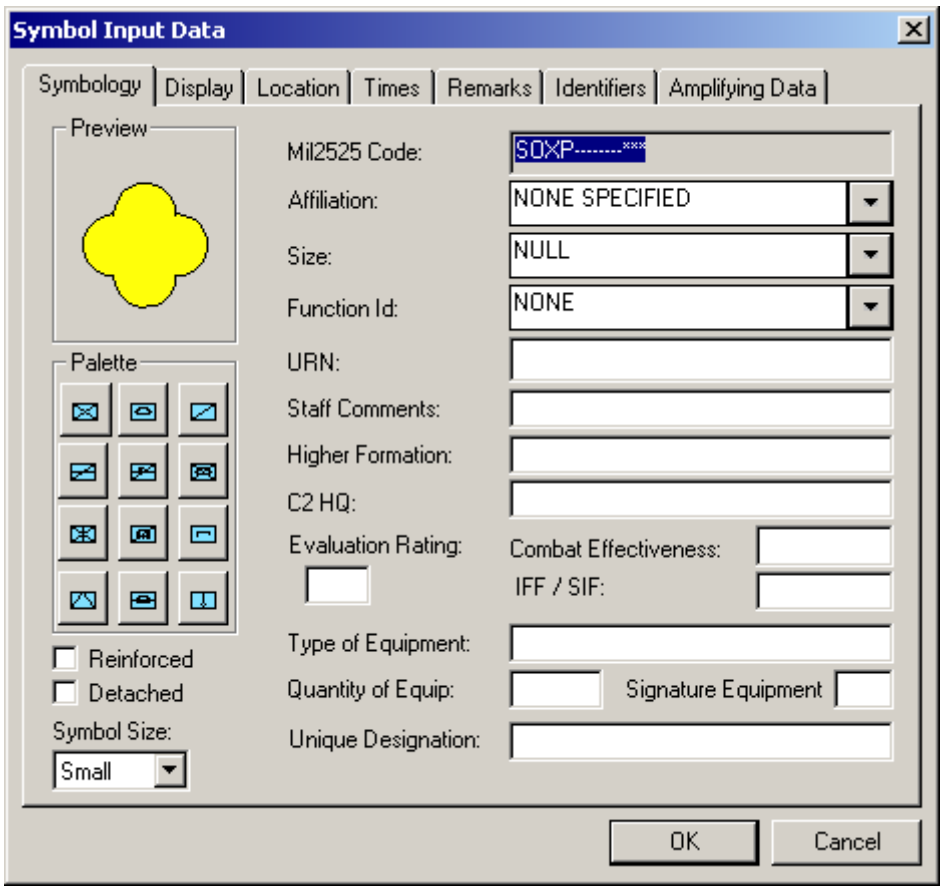


Figure 104. Symbol Input Data

The following fields of information appear under the Symbology tab:

- **Mil2525 Code:** The **Mil2525 Code** is a code that is automatically generated based on values chosen for the **Affiliation**, **Size**, and **Function Id** fields. This field cannot be edited.
- **Affiliation:** C2PC provides different unit affiliation from Friendly to Hostile. To select a different affiliation, click the down arrow and choose an affiliation from the displayed choices (Figure 105).

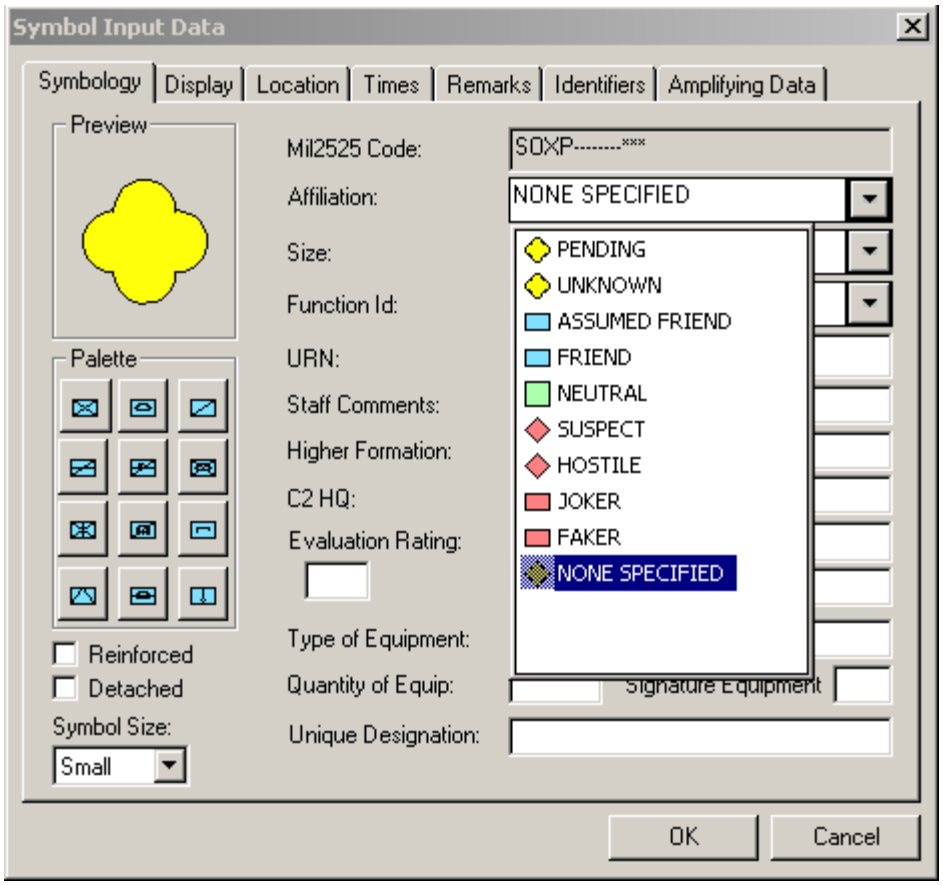


Figure 105. Symbol Affiliation

- **Size:** This displays the currently selected size of the symbol. C2PC provides a variety of sizes from fire team to MEF size. To select a different size, click the down arrow and choose a size from the displayed choices. Small characters will appear above the symbol in the map window to represent the chosen size (Figure 106).

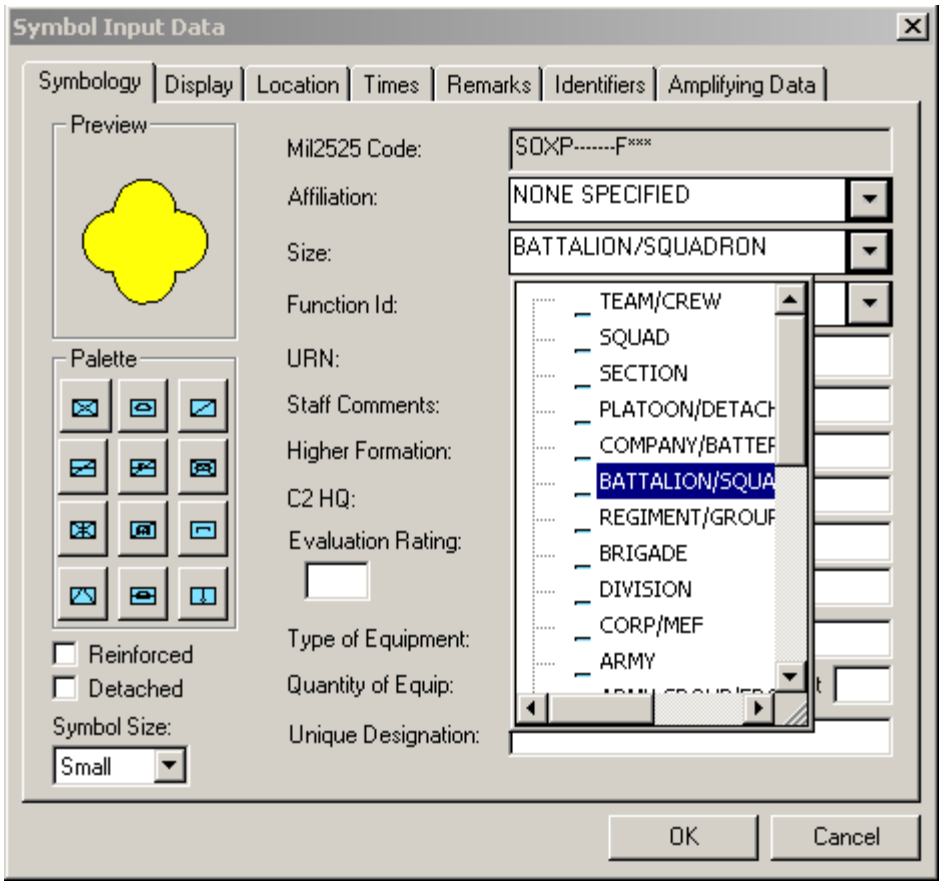


Figure 106. Symbol Size Selection

- **Function Id:** This displays the currently selected function Id. What kind of symbol is it? Is it an Infantry unit or Engineers? C2PC allows you to select the type of symbol or the Function Id for that specific symbol. C2PC provides a huge selection of functions ids. To select a different Function Id, click the down arrow and choose a function Id from the displayed choices. The function Id determines the look of the icon within the symbol (Figure 107).

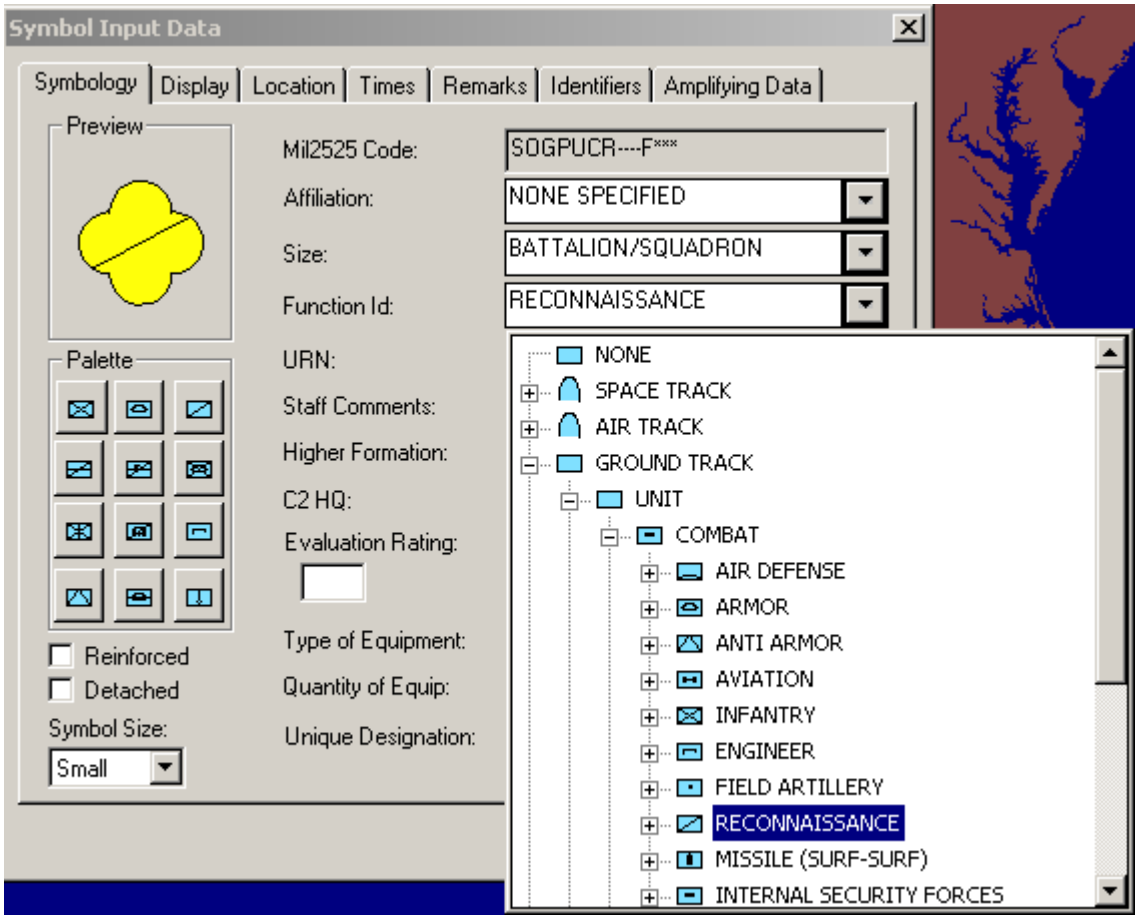


Figure 107. Symbol Function ID

- **Staff Comments:** Enter any free text comments.
- **Higher Formation:** Enter the number or title of the higher echelon command for the symbol.
- **C2 HQ:** Enter the name of a special C2 headquarters for the symbol.
- **Combat Effectiveness:** Enter the combat effectiveness information for the symbol.
- **IFF/SIF:** Enter the IFF/SIF identification mode and code for the symbol.
- **Type of Equipment:** Enter any equipment class or type information for the symbol.
- **Quantity of Equip:** Enter any equipment quantity information for the symbol.
- **Signature Equipment:** Click this checkbox for detectable electronic signatures or leave this checkbox blank if there are no detectable electronic signatures.

- **Unique Designation:** Enter the unique designation.
- **Reinforced:** Click this checkbox if the unit has additional resources allocated to it to reinforce it.
- **Detached:** Click this checkbox if the unit has reduced resources.
- **Symbol Size:** Choose the display size for the symbol in the C2PC main window. Choices include Tiny, Small, Medium, Large, and Huge (Figure 108).

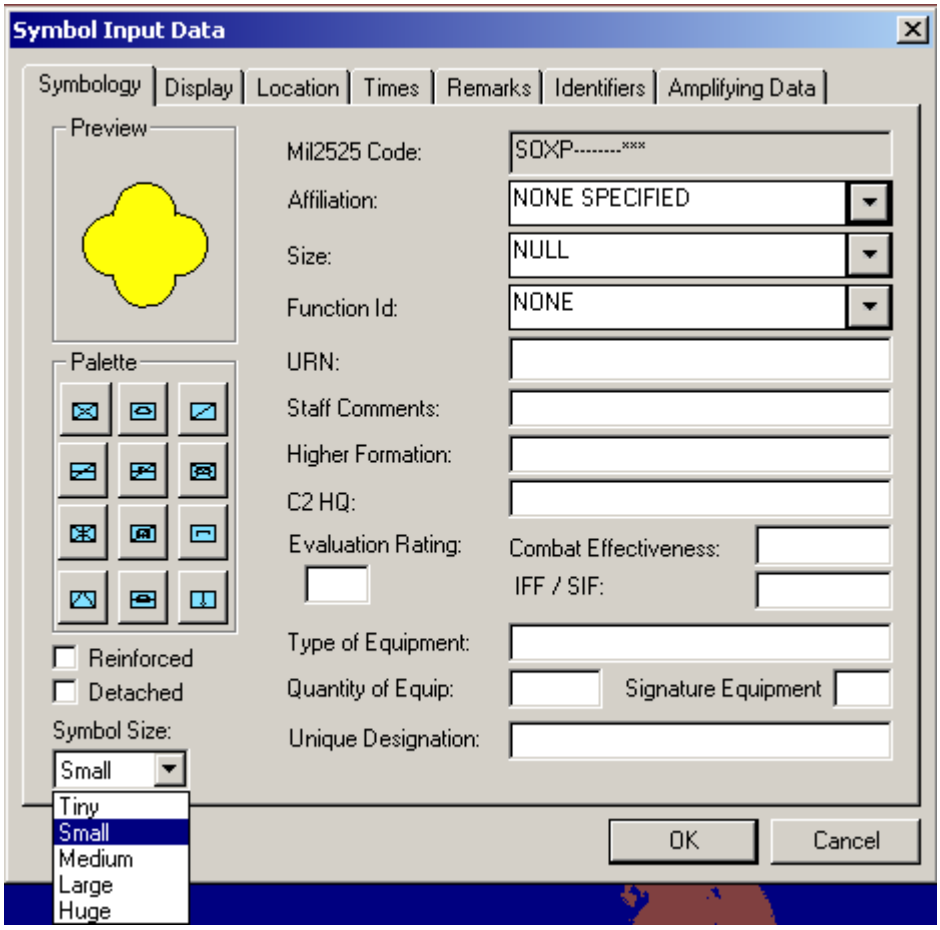


Figure 108. Symbol Size

- **Preview box:** The **Preview** box shows what the symbol looks like. The symbol changes based on entries in the **Affiliation**, **Size**, and **Function Id** fields. You can save the current symbol to the **Palette** by dragging the symbol from the **Preview** box to one of the nine Palette boxes.
- **Palette:** The **Palette** contains nine boxes that can be used to save symbol information. To save symbol information to the **Palette**, drag the symbol in the **Preview** box to one of the nine **Palette** boxes. Information that is saved

for the symbol includes the values in the **Mil2525 Code**, **Affiliation**, **Size**, and **Function Id** fields. To retrieve symbol information from the **Palette**, click on the **Palette** box containing the symbol information you want to retrieve. The values in the **Mil2525 Code**, **Affiliation**, **Size**, and **Function Id** fields change to the values from the saved symbol information and the symbol in the **Preview** box changes to the chosen symbol.

The **Display** tab displays checkboxes for many items associated with the symbol. Click any of these checkboxes on to display the chosen information next to the symbol in the map window.
Click on the large symbol in the **Display** tab window to display the **Display Option** window (Figure 109).

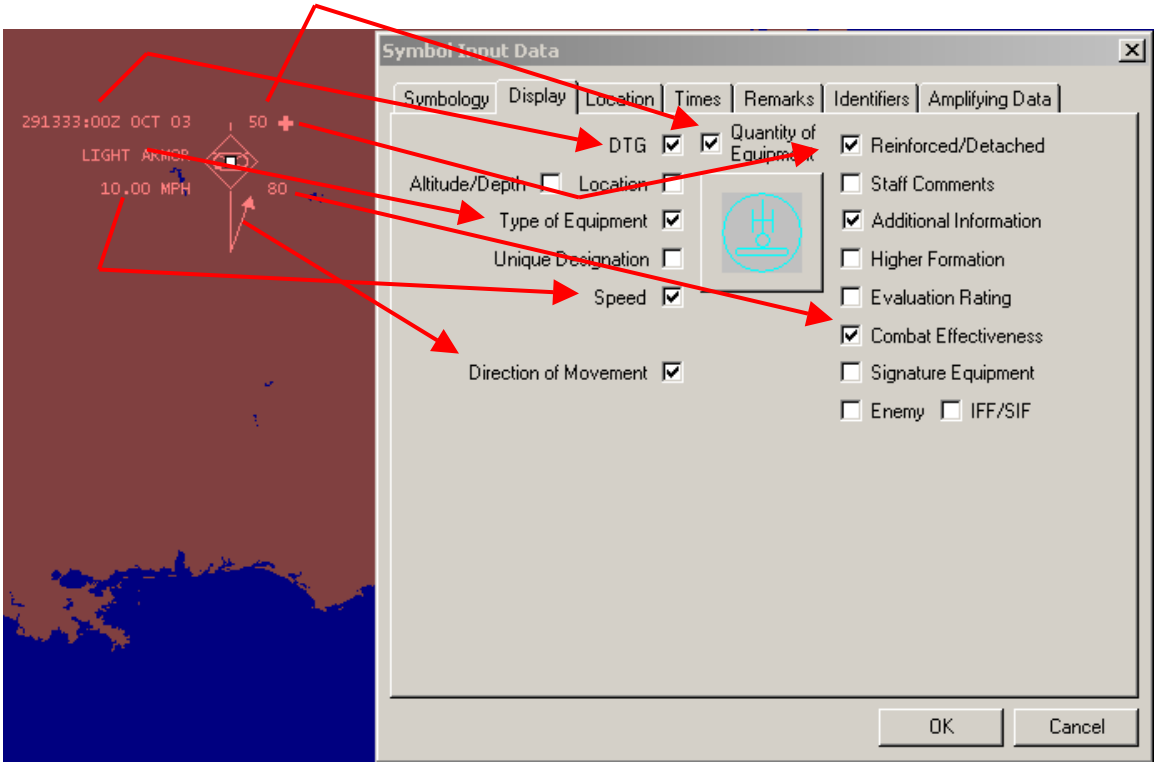


Figure 109. Symbol Display Tab using MIL-STD-2525

NOTE: The Display tab appears when in MIL-STD-2525 mode only.

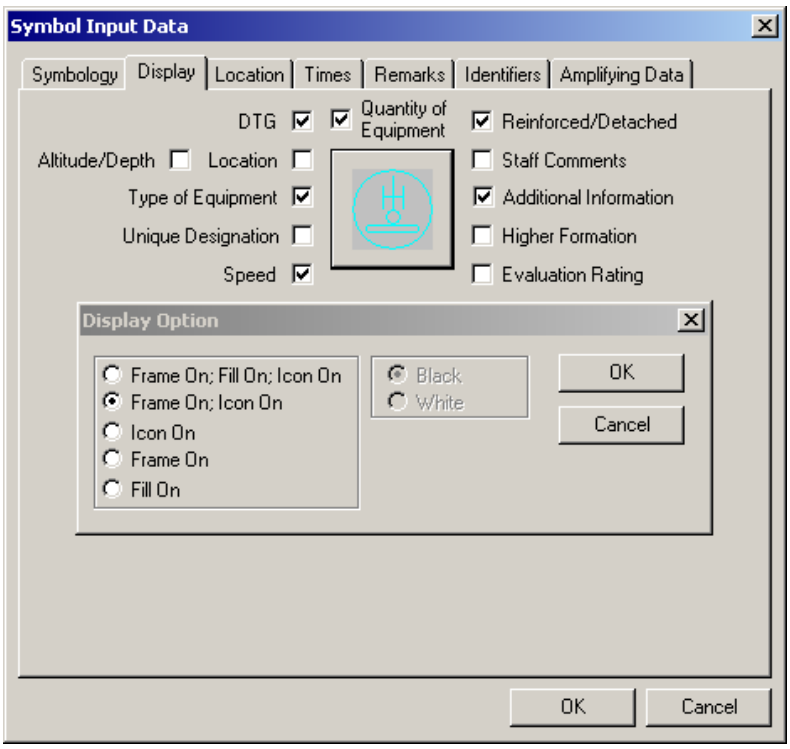


Figure 110. Symbol Display Option

The **Display Option** (Figure 110) window allows you to turn on/off symbol features, and also change these features to black or white.
There are three symbol features that can be turned on/off from this window including:

- **Frame:** This is the line around the symbol.
- **Fill:** This is the symbol color.
- **Icon:** This is the icon displayed within the symbol.

Use the radial buttons in the left box to turn on/off these three symbol features, in combination or independently.
The frame and icon can be colored black or white. Click the **Black** radial button to color them black or the **White** radial button color them white.
Figure 111 shows the selection of **Frame On; Fill On; Icon On**. Notice hat this is the display we are used to see.

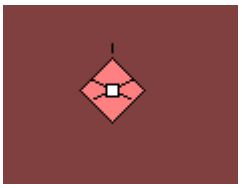


Figure 111. Symbol display Frame On; Fill On; Icon On selected

Click the **Location** tab if you would like to change or update the position, altitude/depth, bearing and the speed fields.

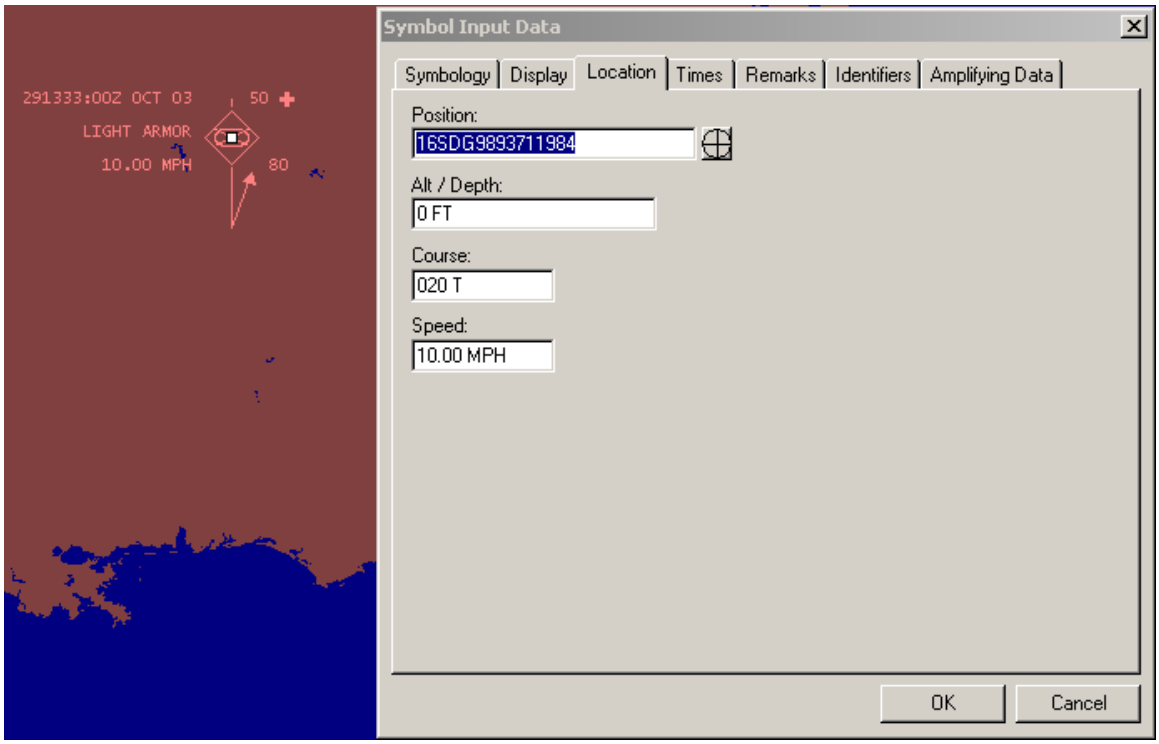


Figure 112. Symbol Location

The Location tab displays the following fields:

- **Position:** Enter the symbol position. Enter this from the keyboard or enter the position automatically as follows:
    1. Click the crosshair button to the right of the Position field.
    2. Click a position in the map window.
- **Alt/Depth:** Enter the altitude or depth of the symbol. If a depth is entered, enter this as a negative number. If an altitude is entered, enter this as a positive number.
- **Course:** Enter the course for the symbol.
- **Speed:** Enter the speed for the symbol.

The **Times**, **Remarks**, **Identifiers**, and **Amplifying Data** tabs contain fields that are the same for many of the overlay tools.

After entering appropriate information in the **Symbol Input Data** window, click the **OK** button to accept any changes.

NOTE: Modifications are not permanently saved until the overlay is saved.

f. Rectangle

Use the **Rectangle** tool  to create a rectangle in the map window. To draw a rectangle in the map window:

- Click the **Rectangle** tool from the **Tools Palette** or the **Insert** menu.
- In the map window, click and drag to create a rectangle.

To edit a rectangle already drawn in the map window:

- Click the **Select** tool.
- Click the rectangle to select it. When selected, little white squares appear at upper left and lower right corners of the rectangle, and at the center point.
- Drag either selected corner on the rectangle to a new location. Drag the center point to move the entire rectangle to a new location.

Another way to edit a rectangle is to double-click the rectangle in the map window, double-click the rectangle object in the overlay list, or select the rectangle and choose the **Properties** command from the **Overlays** menu to display the **Rectangle Input Data** dialog box (Figure 113).

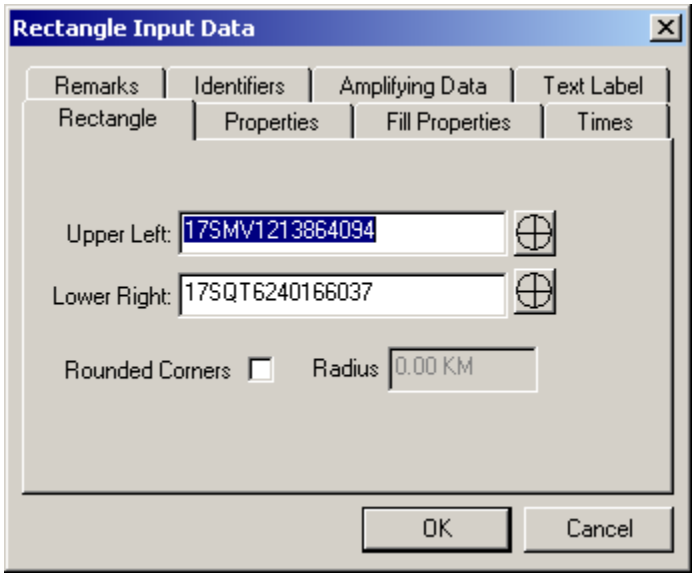


Figure 113. Rectangle Input Data

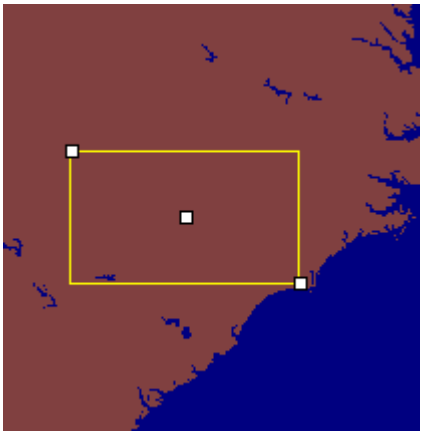


Figure 114. Rectangle graphic object

The **Rectangle Input Data** dialog box contains seven tabs to allow you to enter different information about the rectangle.
The **Rectangle** tab is the default tab and displays the following boxes.

- **Upper Left:** Enter the position of the upper left corner of the rectangle.
- **Lower Right:** Enter the position of the lower right corner of the rectangle.
- **Rounded Corners:** If you want the rectangle to have rounded corners, select this check box and enter a value in the **Radius** box.
- **Radius:** If the **Rounded Corners** check box is checked, the **Radius** box becomes active. Enter a value to specify the amount of rounding for the corners of the rectangle. The higher the value entered the more rounded the corners display.

g. Box

Use the **Box** tool  to create a box in the map window. A box is a rectangle that can be rotated. To draw a box in the map window:

- Click the **Box** tool from the **Tools Palette** or **Insert** menu.
- In the map window, click and drag to create a box.

To edit a box already drawn in the map window:

- Click the **Select** tool.
- Click the box to select it. When selected, little white squares appear at the midpoints of each side of the box and at the center of the box.
- Drag any of the midpoints to change the shape of the box. Drag the center point to move the entire box to a new location.

Another way to edit a box is to double-click the box in the map window, double-click the box object in the overlay list, or select the box and choose the **Properties** command from the **Overlays** menu to display the **Box Input Data** dialog box (Figure 115).

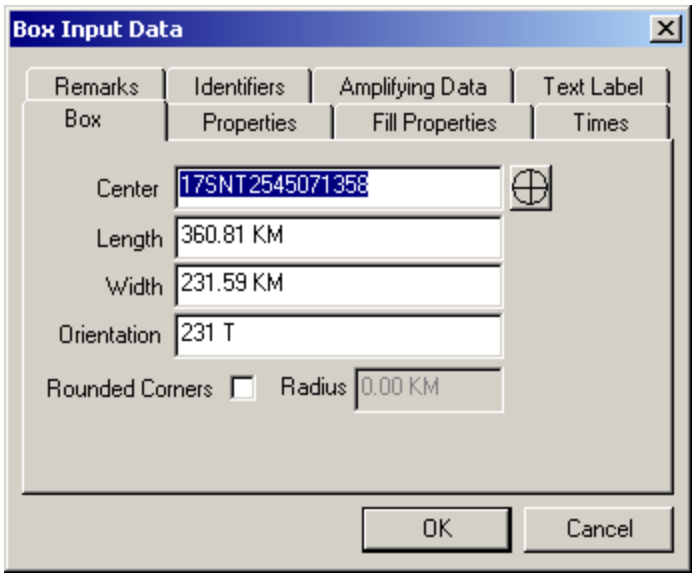


Figure 115. Box Input Data

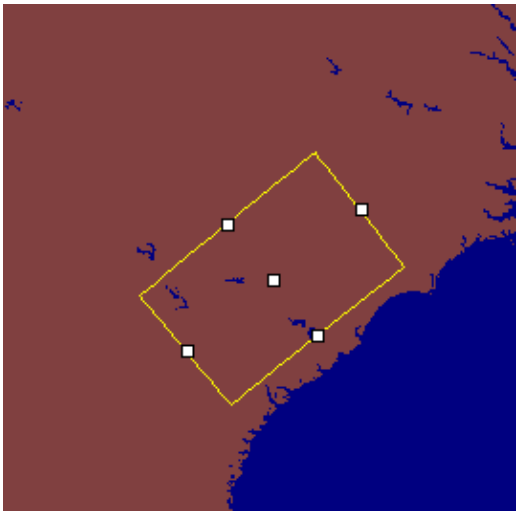


Figure 116. Box graphic object

The **Box Input Data** dialog box contains seven tabs to allow you to enter different information about the box.
The **Box** tab is the default tab and displays the following boxes.

- **Center:** Enter the position of the center point of the box.
- **Length:** Enter the length of one of the sides of the box. This will define the length of the top and bottom sides of a box oriented at 90 degrees.
- **Width:** Enter the width of the box. This will define the length of the left and right sides of a box oriented at 90 degrees.
- **Orientation**: Enter the angle (in degrees True) for the box.
- **Rounded Corners:** If you want the box to have rounded corners, select this check box and enter a value in the **Radius** box.
- **Radius:** If the **Rounded Corners** check box is checked, the **Radius** box becomes active. Enter a value to specify the amount of rounding for the corners of the rectangle. The higher the value entered the more rounded the corners display.

h. Circle

Use the **Circle** tool to create a circle in the map window. To draw a circle in the map window:

- Click the **Circle** tool from the **Tools Palette** or **Insert** menu.
- In the map window, left click and while keeping the left mouse button pressed drag the mouse to create the desired circle size.

To edit a circle already drawn in the map window:

- Click the **Select** tool.
- Click the circle to select it. When selected, little white squares appear along the circle and at the center of the circle.
- Drag any of the select points along the circle to shrink or enlarge the circle. Drag the center point to move the entire circle to a new location.

Another way to edit a circle is to double-click the circle in the map window, double-click the circle object in the overlay list, or select the circle and choose the **Properties** command from the **Overlays** menu to display the **Circle Input Data** dialog box (Figure 117).

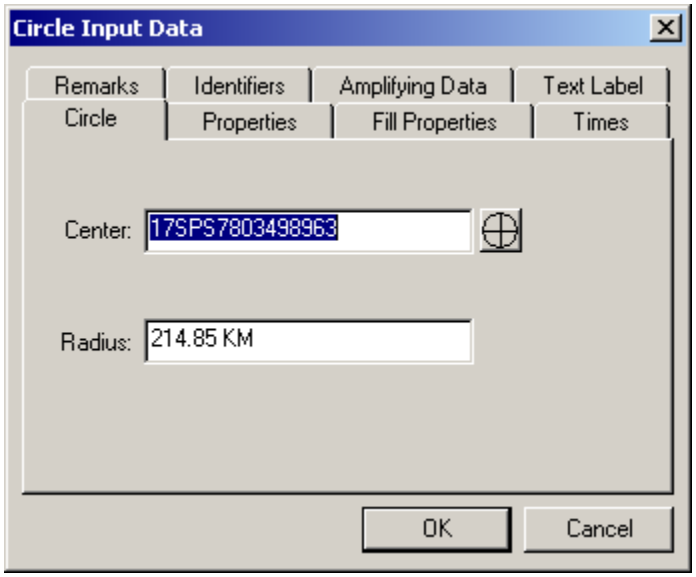


Figure 117. Circle Input Data

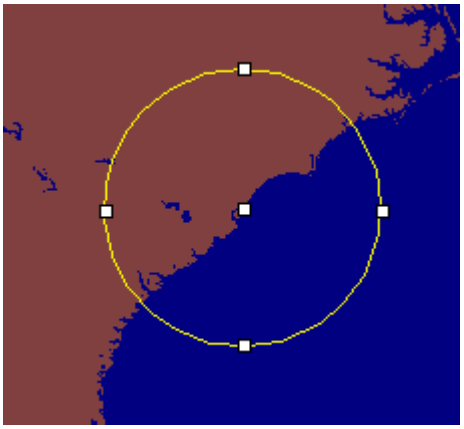


Figure 118. Circle graphic object

The **Circle Input Data** dialog box contains seven tabs to allow you to enter different information about the circle. The **Circle** tab is the default tab and displays the following boxes.

- **Center:** Enter the position of the center point of the circle.
- **Radius**: Enter the radius of the circle.

i. Triangle

Use the Triangle tool  to create a triangle in the map window. To draw a triangle in the map window:

- Select the **Triangle** tool on the **Tools Palette** or from the **Insert** menu.

- In the map window, left click and while keeping the left mouse button pressed drag the mouse until the desire size of the triangle is achieved. Release the mouse button when done.

To edit a triangle already drawn in the map window:

- Click the **Select** tool.
- Click the triangle to select it. When selected, little white squares appear at the corners of the triangle, at the midpoints of each line, and at the center point.
- Drag any selected corner or line midpoint on the triangle to a new location. Drag the center point to move the entire triangle to a new location.

Another way to edit a triangle is to double-click the triangle in the map window, or double-click the triangle object in the overlay list, or select the triangle and choose the **Properties** command from the **Overlays** menu to display the **Triangle Input Data** dialog box (Figure 119).

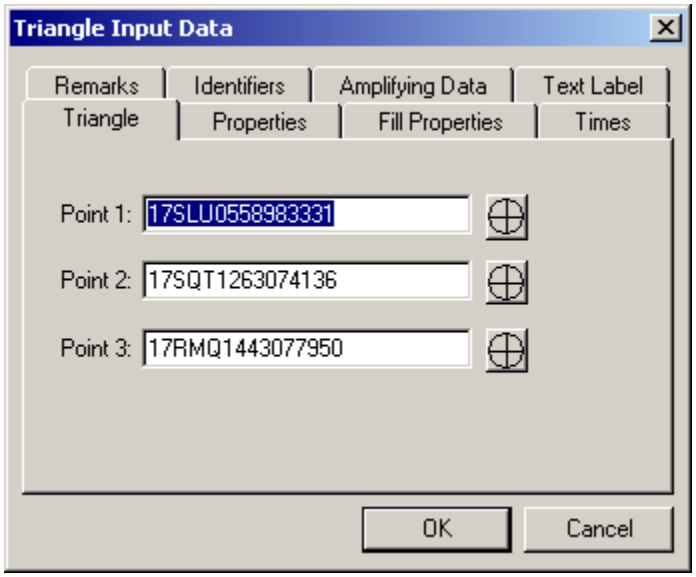


Figure 119. Triangle Input Data

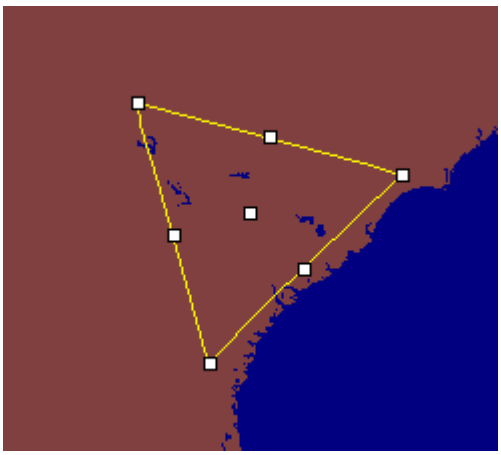


Figure 120. Triangle graphic object

The **Triangle Input Data** dialog box contains eight tabs to allow you to enter different information about the triangle. The Triangle tab is the default tab and displays the **Point 1**, **Point 2**, **Point 3** boxes. Enter the positions of the three corners of the triangle.

j. Arc

Use the **Arc** tool  to create an arc in the map window. To draw an arc in the map window:

- Click the **Arc** tool from the **Tools Palette** or the **Insert** menu.

- In the map window, left click and while keeping the left mouse button pressed drag the mouse to create the desired arc size. Release the mouse button when done.

To edit an arc already drawn in the map window:

- Click the **Select** tool.
- Click the arc to select it. When selected, little white squares appear at the center point, at both ends of the arc, and in the middle of the arc.
- Drag either endpoint to stretch or compress the arc. Drag the center point to move the entire arc to a new location. Drag the point in the middle of the arc to move the arc closer to or further from the center point.

Another way to edit an arc is to double-click the arc in the map window, double-click the arc object in the overlay list, or select the arc and choose **Properties** from the **Overlays** menu to display the **Arc Input Data** dialog box (Figure 121).

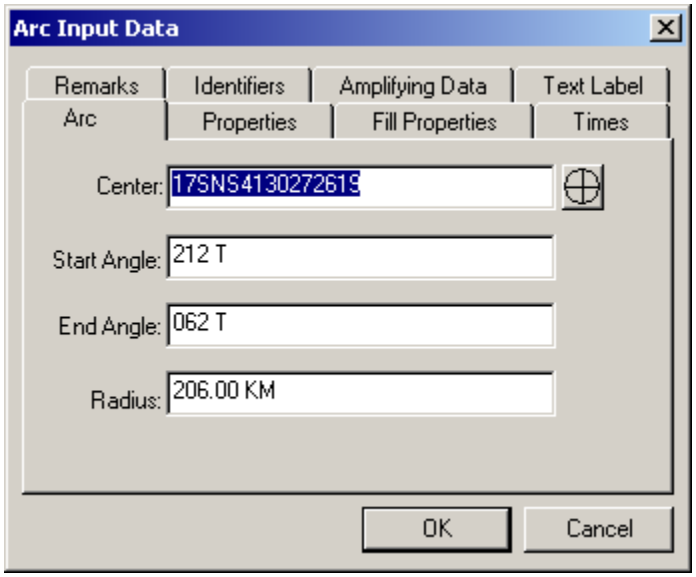


Figure 121. Arc Input Data

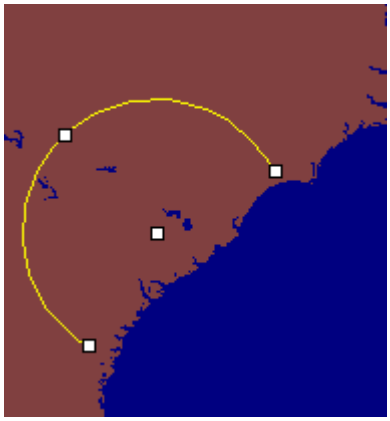


Figure 122. Arc graphic object

The **Arc Input Data** dialog box contains seven tabs to allow you to enter different information about the arc. The **Arc** tab is the default tab and displays the following boxes:

- **Center:** Enter the center position point for the arc.
- **Start Angle:** Enter the start angle for the arc.
- **End Angle:** Enter the end angle for the arc.

- **Radius:** Enter the radius of the arc.

k. Sector

Use the **Sector** tool  to create a sector in the map window. To draw a sector in the map window:

- Click the **Sector** tool from the **Tools Palette** or **Insert** menu.
- In the map window, left click and while keeping the left mouse button pressed drag the mouse to create the desired sector size. Release the mouse button when done.

To edit a sector already drawn in the map window:

- Click the **Select** tool.
- Click the sector to select it. When selected, little white squares appear at many points along the sector, and at the center point.
- Drag any point on the sector to change the shape of the sector. Drag the center point to move the entire sector to a new location.

Another way to edit a sector is to double-click the sector in the map window, double-click the sector object in the overlay list, or select the sector and choose the **Properties** command from the **Overlays** menu to display the **Sector Input Data** dialog box (Figure 123).

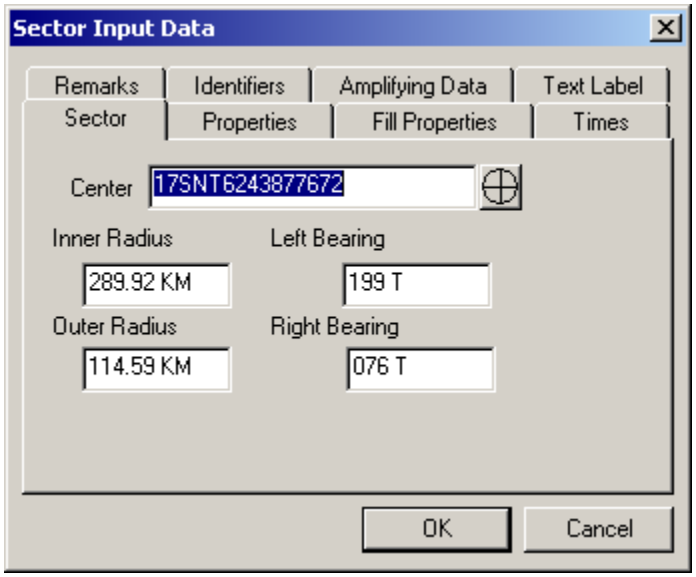


Figure 123. Sector Input Data

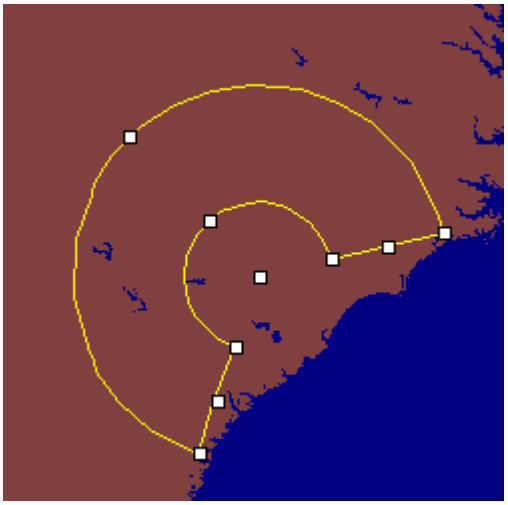


Figure 124. Sector graphic object

The **Sector Input Data** dialog box contains seven tabs to allow you to enter different information about the sector. The **Sector** tab is the default tab and displays the following boxes.

- **Center:** Enter the center point for the sector.
- **Inner Radius:** Enter the distance from the center to the inner arc of the sector.
- **Outer Radius:** Enter the distance from the center to the outer arc of the sector.
- **Left Bearing:** Enter the bearing angle (measured from 000 degrees True) for the left bearing of the sector.
- **Right Bearing**: Enter the bearing angle (measured from 000 degrees True) for the right bearing of the sector.

l. Text

Use the Text tool **T** to enter text that will display in the map window. To use the **Text** tool:

- Click the **Text** tool (or choose **Insert: Text**).
- In the map window, click the area where you want the text to appear. The word "Text1" (default text) appears in the map window at the chosen location. You can select the text and drag it to move the text to a new location.
- To change the word "Text1" to the text that you want, double-click the word "Text1" in the map window, or double-click the text object in the overlay list, or select the text and choose **Overlays: Properties** to display the **Text Input Data** window (Figure 125).

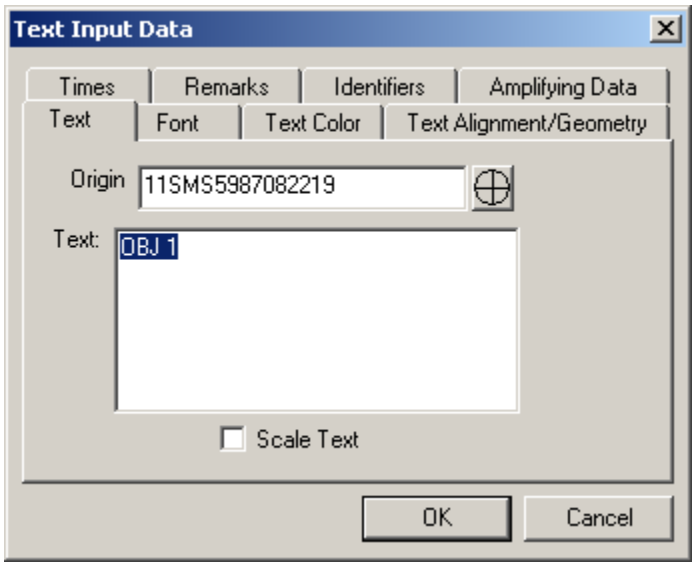


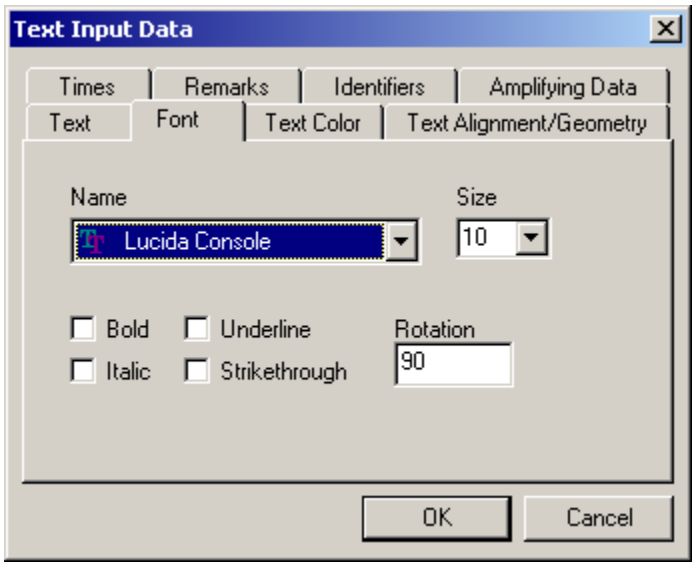
Figure 125. Text Tab / Text Input Data

Figure 126. Text graphic object

The **Text Input Data** window contains eight tabs to allow you to enter different information about the text. The Text tab is the default tab and displays the following fields:

- **Origin:** Enter the position for the text.
- **Text:** Enter the text to appear in the map window. To enter text on the next line, press **Ctrl+Enter**.

Click the **Font** tab to display additional text fields.



NOTE: Only Courier, Helvetica, Lucida, Schoolbook, Times, and Roman can be transmitted between C2PC and the UB host system. If any other font is used, it is automatically mapped to one of these fonts when transmitted.

Figure 127.Font Tab / Text Input Data

The **Font** tab displays (Figure 127) the following fields:

- **Name:** This displays the currently selected text font. To select a different font, click the down arrow and choose a font from the displayed choices.
- **Size:** This displays the currently selected text size. To select a different size, click the down arrow and choose a size from the displayed choices.
- **Checkboxes:** The checkboxes can be used to set additional features for the text. Click any of these checkboxes to turn on that feature for the text.
- **Rotation:** Text is set to a default rotation of 90 degrees. To rotate the text, change the value in this field. Note that only text with TrueType fonts may be rotated. TrueType fonts are those fonts with the TT symbol in front of them in the font list.
- Click the Text Color tab to display additional text fields.

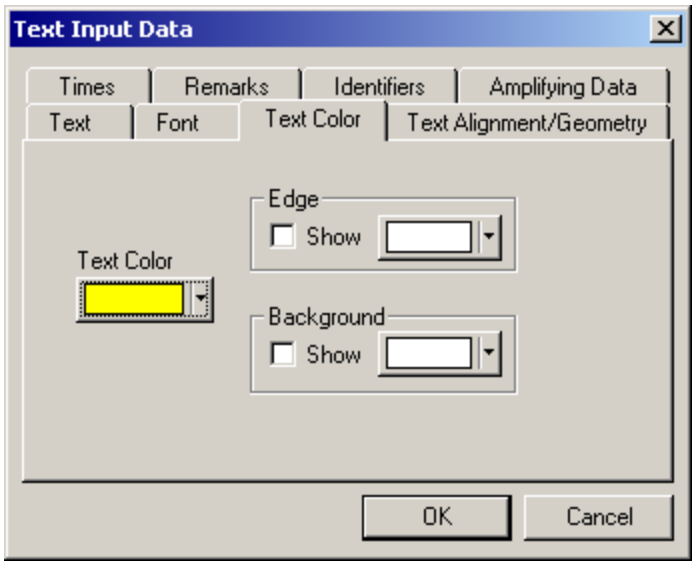


Figure 128. Text Color Tab / Text Input Data

The Text Color tab (Figure 128) displays the following fields:

- **Text Color:** The **Text Color** box displays the currently selected color for the text. To choose a different color, click the down arrow and choose a color from the displayed choices.
- **Edge:** The **Edge** box displays the currently selected color for a box that may be displayed around the text. To choose a different color, click the down arrow and choose a color from the displayed choices. To turn on this box in the map window, click the checkbox.
- **Background:** The **Background** box displays the currently selected color for a background color that may be displayed behind the text. To choose a different background color, click the down arrow and choose a color from the displayed choices. To turn on the background color in the map window, click the checkbox.

m. Freehand

Use the **Freehand** tool  to create a freehand polyline.

To draw a freehand polyline in the map window:

- Click the **Freehand** tool (or choose **Insert: Freehand**).
- In the map window, left click and while keeping the left mouse button pressed, drag the mouse in any direction desired in order to draw the freehand polyline.
- When finished, release the mouse button.

To edit a freehand polyline already drawn in the map window:

- Click the **Select** tool.
- Click on the freehand polyline to select it. Many points along the freehand polyline become little white squares when selected.
- Drag any of the little white squares to a new location.

Another way to edit a freehand polyline is to double-click the freehand polyline in the map window, or double-click the freehand polyline object in the overlay list, or select the freehand polyline and choose **Overlays: Properties** to display the **Polyline Input Data** window (Figure 129).

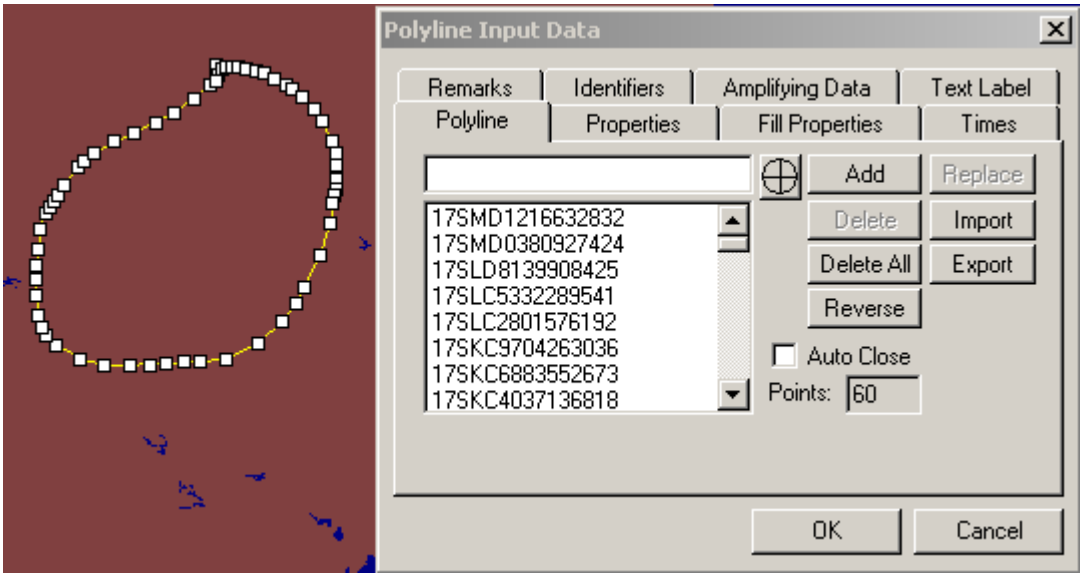


Figure 129. Polyline Input Data

The **Polyline Input Data** window displayed for a freehand polyline is exactly the same as the **Polyline Input Data** window displayed for a polyline object.

n. Tactical Object

Use the **Tactical Object** tool to create a tactical object like an objective area, check point or listening point. C2PC provides a great variety of tactical objects in support of overlays for course of action development. Among those objects are **Tactical Point**, **Tactical Area** and **Tactical Line**.

To draw an tactical object in the map window just follow the same procedures as to draw a **Symbol**.

To edit a tactical object already drawn in the map window just follow the same procedures as to edit a **Symbol**.

4. The Data Input Box Properties/Fill Properties/Times/Remarks/ Identifiers and Amplifying Data Tabs

a. Properties

The **Properties** tab is shown in Figure 130. This tab will show in most of the objects. It will allow you to change the properties of the object. Some of the fields are:

- **Style:** Select the desire style that will be basically the border of the object. It can be applied to lines, arrows, rectangles and circles among other objects.
- **Thickness:** Select the desire thickness for the selected style.
- **Color:** Select the desire color for the style selected

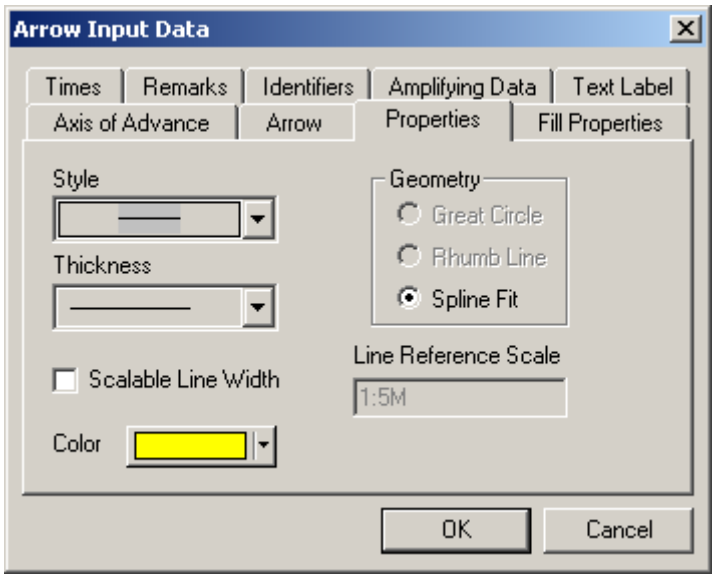


Figure 130. Properties Tab

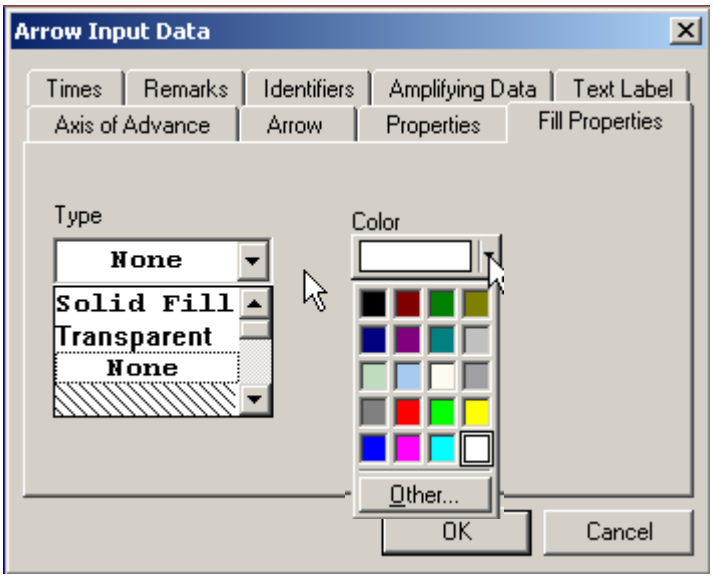


Figure 131. Fill Properties Tab

b. Fill Properties

The **Fill Properties** tab is shown in Figure 131. This tab will show in most of the objects. It will allow you to change the fill properties of the object. The **Fill Properties** fields are:

- **Type:** Select the desire filling type for the object, from solid, transparent to some styles of hash.
- **Color:** Select the color for the type of filling selected.

c. TimesTab

The Times Tab is shown in Figure 132.

- **Created:** Displays the DTG when the line was created. This box cannot be edited.
- **Modified:** Displays the DTG when the line was most recently modified. This box cannot be edited.
- **Start DTG:** This box is currently inactive. Any value displayed in this box has no meaning at the moment. Enter the start DTG for when the object is good.
- **End DTG:** This box is currently inactive. Any value displayed in this box has no meaning at the moment. Enter the end DTG or the expiration date of that object.

d. Remarks

Contains four lines for entering freeform text remarks about the graphic object created (Figure 133). Even though there is no direction or mandate of what to enter into these text boxes or even to use them, some recommendations are given.

NOTE: Unit SOP can dictate what type of information can be entered into these text boxes.

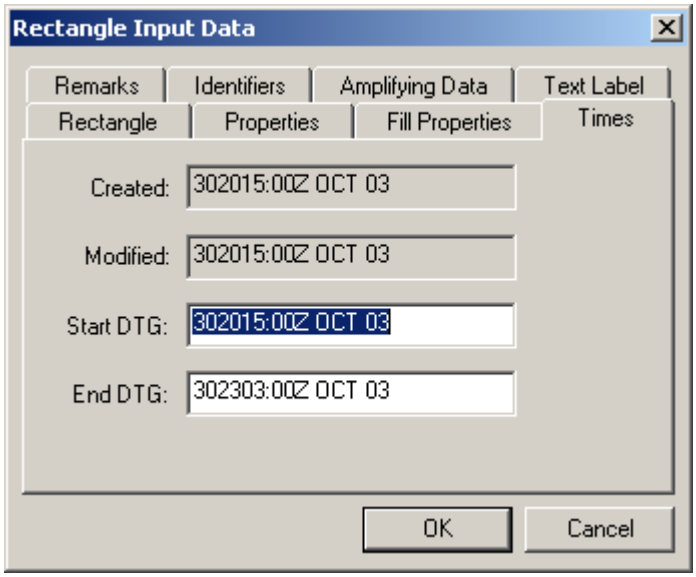


Figure 132. Times Tab

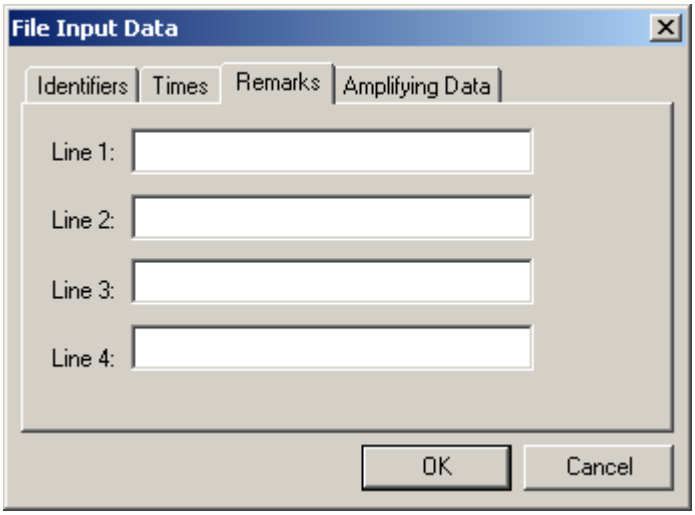


Figure 133. Remarks Tab

Some information that can be entered into the generic text boxes:

- Point of Contact for that overlay
- Center Coordinate
- Map Scale
- Width/Percentage (Zoom used)

Using this information, person receiving the overlay can duplicate exactly the same view as the creator of that overlay.

e. Identifiers

The Identifier tab contains three text boxes (Figure 134):

- **Name:** Displays the name of the overlay element. You may change the name of the line in this box.
- **Source:** Enter the name of the local command.
- **Description:** This box contains space for a brief description of the created graphic object.

f. Amplifying Data

The **Amplifying Data** tab contains an area for entering any freeform text about the graphic object created. You can even paste MS Word text (Figure 135).

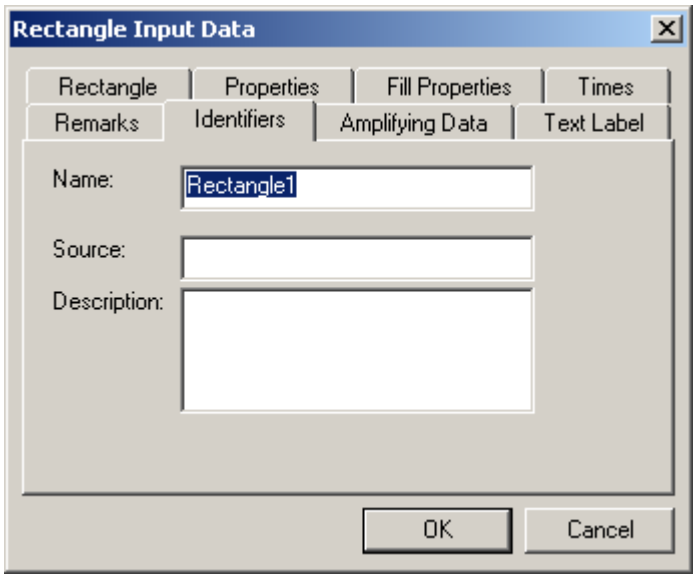


Figure 134. Identifiers Tab

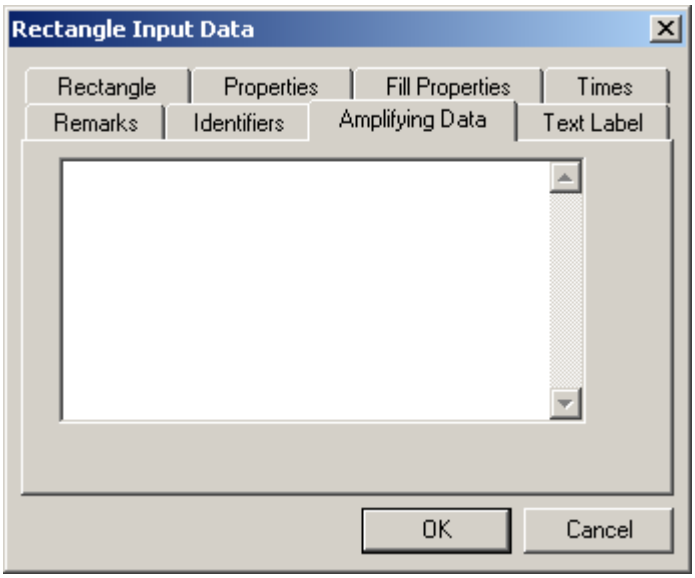


Figure 135. Amplifying Data Tab

5. Saving the Overlay

When an overlay is created or modified, an asterisk (*) appears next to the overlay name in the overlays list (Figure 136). This indicates the overlay has been changed but not yet permanently saved. To permanently save the changes, select the overlay in the overlays list and choose the **Save** command from the **Overlays** menu (Figure 137) or from the right-click shortcut menu (Figure 138).

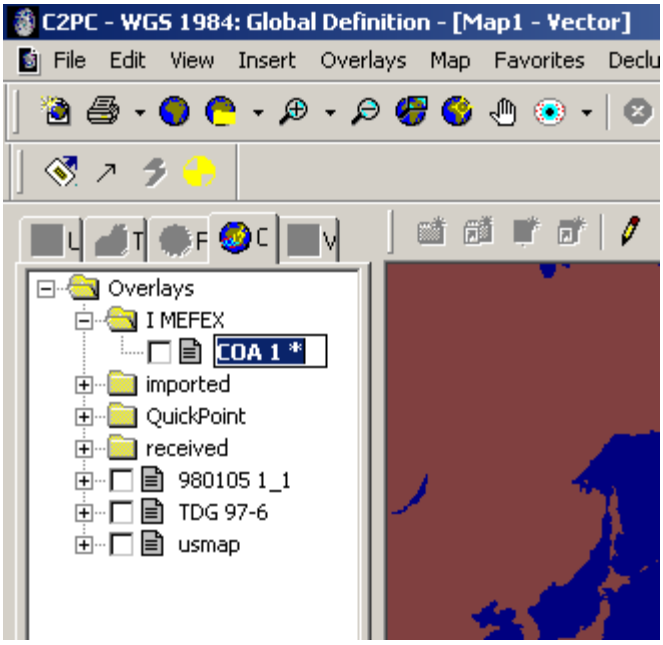


Figure 136. Saving an Overlay

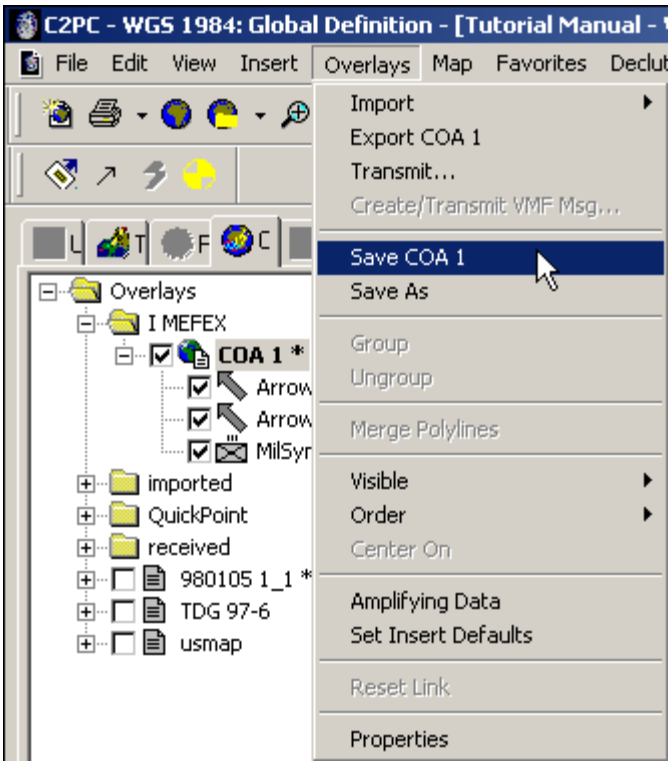


Figure 137. Saving on Overlay using the Overlays menu

Once you have save the overlay the asterisk (*) will disappear.

NOTE: Modifications are not permanently saved until the overlay is saved from the overlay list with the right-click shortcut menu's **Save** command, or with the **Save** command from the **Overlays** menu.

NOTE:
NAMING CONVENCTION FOR OVERLAYS IS VERY IMPORTANT.

THE INFORMATION MANAGEMENT (IM) PLAN SHOULD ADDRESS THIS ISSUE.

YOU COULD OVERWRITE ANOTHER OVERLAY WHEN SHARING OVERLAYS IN THE C2PC NETWORK.

C2PC WILL NOT ASK YOU IF YOU WANT TO OVERWRITE AN OVERLAY WHEN RECEIVING AN OVERLAY WITH THE SAME NAME, IT WILL OVERWRITE IT.

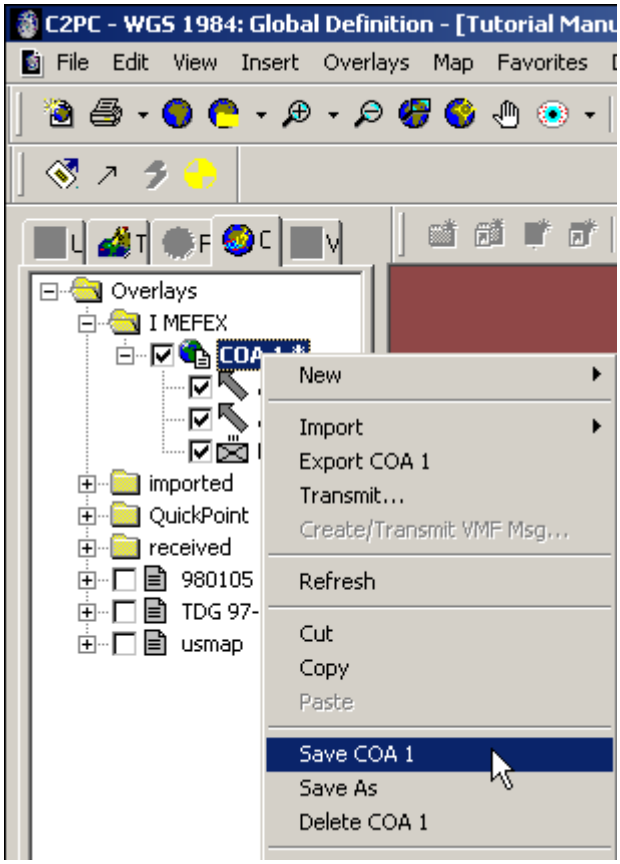


Figure 138. Saving the Overlay File by right clicking

6. Sharing Overlays

On of the advantages of using C2PC for creating overlays is that you can share those overlays with other C2PC users electronically. These users have to be connected into the C2PC network in order to share overlays and information.
The C2PC operator has the ability to send products that have been created within the Overlay injector to other computers within the same network using the **Transmit** command. This is only possible if both computers are able to communicate via the LAN/WAN and the sender has the IP address or computer name of the recipient.
To manually start the C2PC Network select the **Start** button, click **Programs**, choose **C2PC** and then select **Network.**

a. Sharing Overlays

In order to share overlays you need to know who to send the information. C2PC acts like an e-mail application. In order to share overlays you need to know the IP address of the recipient in order to send that overlay or the IP address of the UB host in order for you to import overlays.

Once the C2PC Network is running, select an overlay file to transmit by highlighting it in the **Overlays** tab. With the cursor directly on the file name, right click the mouse and a menu like Figure 139 will show-up. You can also find the **Transmit** command on the Overlays menu. Select the **Transmit** command and an **Interface Selection** dialog box will appear (Figure 140). Select **C2PCNetwork** and click **OK**.

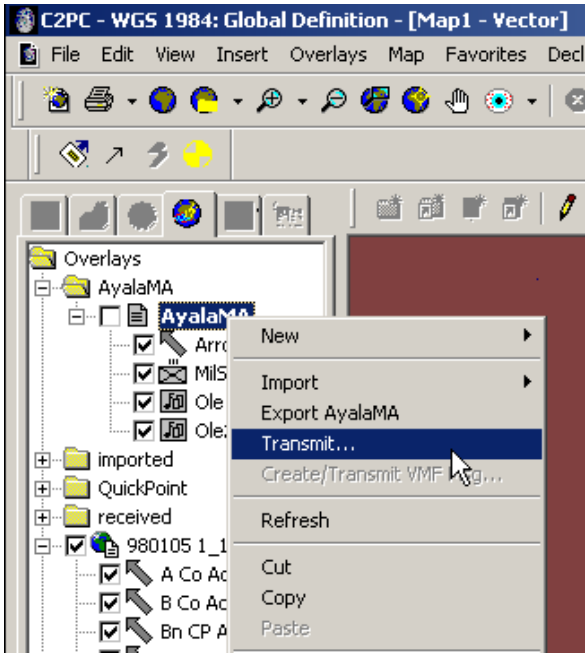


Figure 139. Transmitting and overlay by right clicking and Transmit

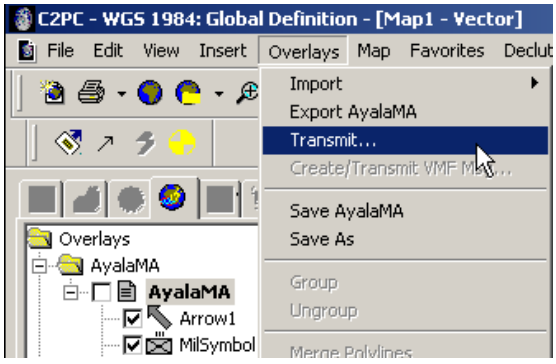


Figure 140. Transmitting and overlay using the Overlays menu

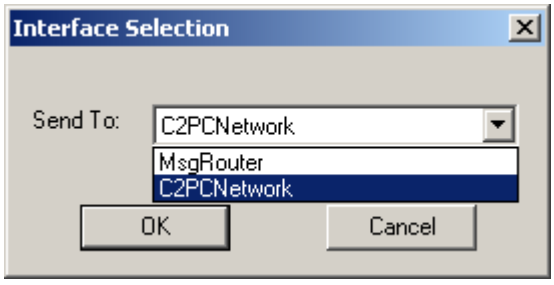


Figure 141. Interface Selection

i. Exporting an Overlay

1) Setting-up the Address Book

There are six buttons at the top of the C2PC Network Host Selection window that allow you to perform various tasks (Figure 142, 143). To create a new Host name:

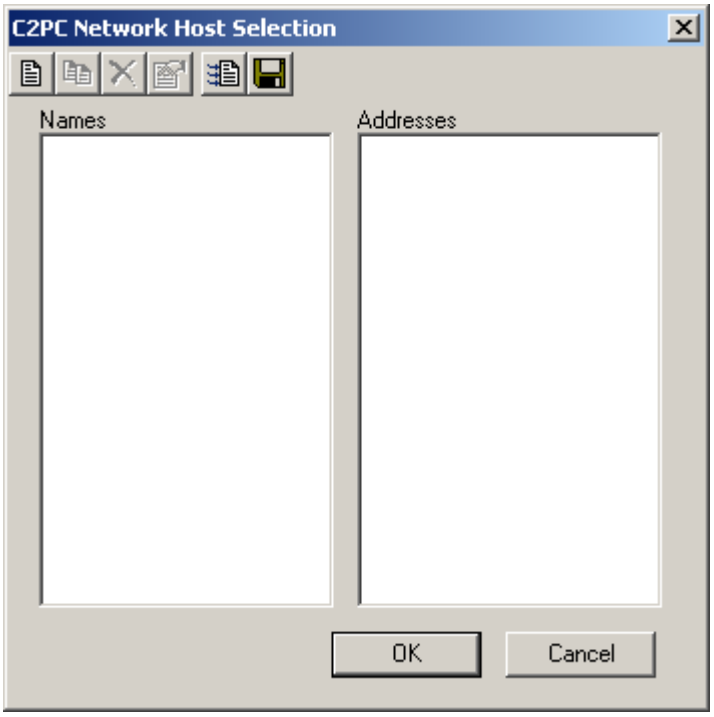


Figure 142. Selection of host where you want to send the overlays

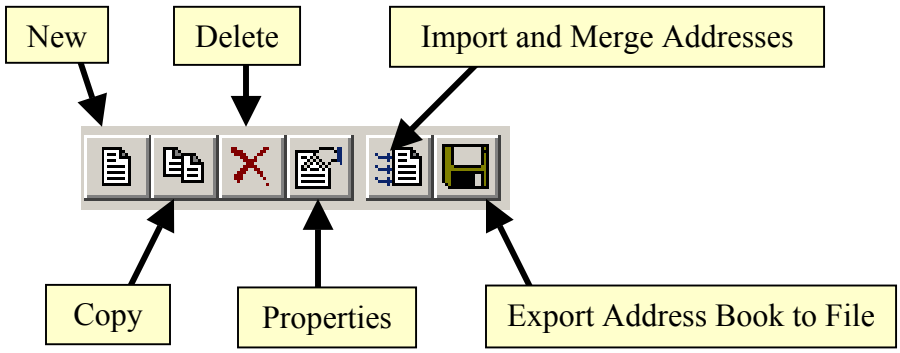


Figure 143. C2PC Network Host Selection Window buttons

- **New**. Use the **New** button to enter and save a new host name and its associated IP Address or machine name. Clicking the **New** button to display the **New** dialog box as shown in Figure 144. Enter a new host name in the Name box at top and enter an associated IP Address or machine name in the **Valid Names or Addresses** box (Figure 144). Once the new host name is setup with its associated IP Address or machine name, click **OK** to save the entry. The new host name will now appear in the Names box of the C2PC Network Host Selection window (Figure 145).

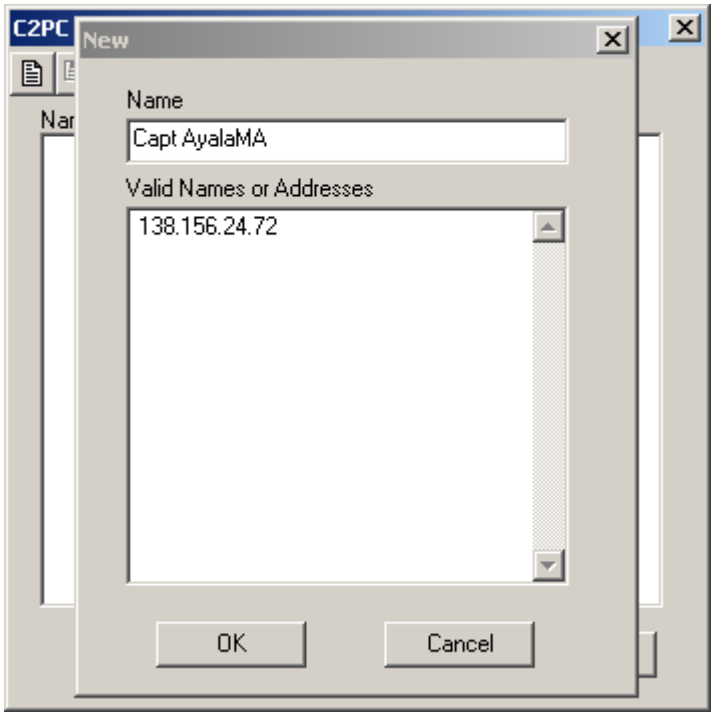


Figure 144. Adding an IP address to the list

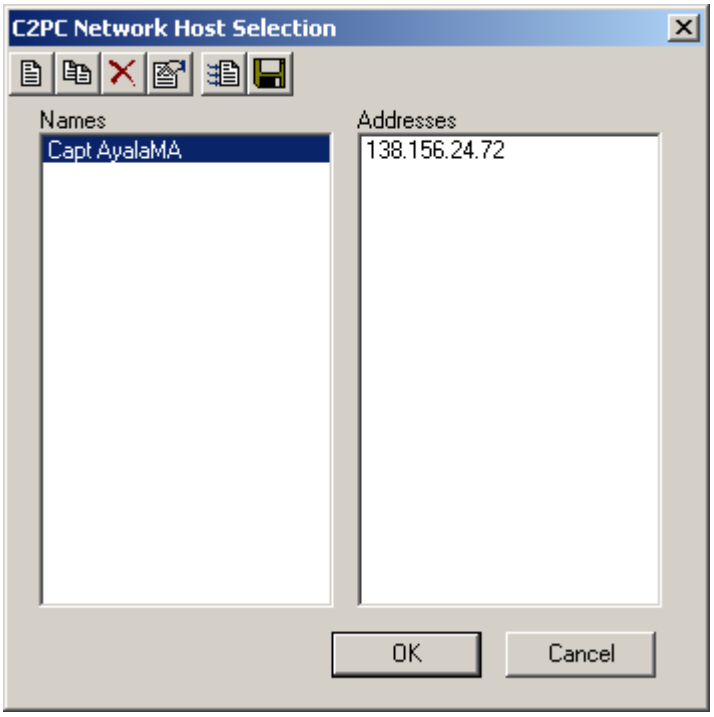


Figure 145. Added address in the list

To transmit an overlay, select the Hostname from the **Names** box of the C2PC Network Host Selection window that you wish to send it to. When a name has been selected (Figure 145), the IP address and/or the computer name for that Hostname will be listed in the **Addresses** box (Figure 145). Select **OK**, and the information is automatically transmitted. To send the same overlay to multiple Hostnames hold down the CTRL key while you make the selections. Once you have highlighted the target addresses to receive the overlay file, click **OK** at the bottom.

VI. Decision Support Toolbox (DSTB)

DSTB is designed to allow the user to perform basic terrain visualization and terrain analysis functions within C2PC. DSTB allows the user to perform these functions when appropriate Digital Terrain Elevation Data (DTED) datasets are available either within a C2PC database, or on a CDROM produced by the National Geospatial-Intelligence Agency (NGA), formerly known as National Imagery and Mapping Agency (NIMA). The DSTB tool allows you to import, manipulate, and analyze terrain data in order to gain better understanding of the effects of terrain on operations. By performing analysis of DTED, VPF, and user-specified data, DSTB assists the user in performing terrain categorization, finding mobility corridors for tactical movement, identifying fast cross-country travel routes, and determining travel times for routes.
DSTB can support the following analysis among others:

- Mobility Corridors
- Visual Elevation Relief
- Visual, Weapons Line-of-Sight (LOS)
- Time-distance factors for tracked, wheeled and foot mobile units based on relief.
- Terrain Masking Analysis
- Point identification of terrain elevation

DSTB performs three types of analysis: point ,linear, and area analysis.

- **Point Analysis**
  - Show the elevation of any point of terrain under the mouse cursor
  - Show the visual or weapons line of sight from a designated point
  - Show all areas that can be reached in a given time from a designated point
  - Show all restricted areas based on line of sight

- **Line Analysis**
  - Finds the fastest path between two points, and provide distance and time to traverse
  - Show the elevation profile (side view) of terrain along a line

- **Area Analysis**
  - Categorize and show terrain within an area as Unrestricted, Restricted, and Severely Restricted

- Determine mobility corridors within an area, and display according to the tactical echelon which the corridor will support,
- Show an elevation and slope relief maps of the terrain within an area.
- Show bands of Elevation and Slope

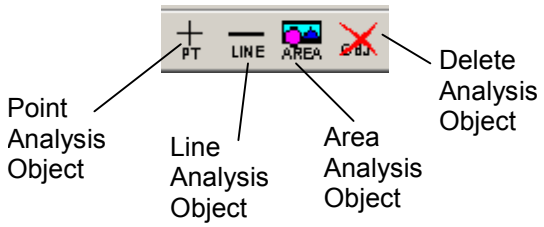


Figure 146. DSTB Analysis Objects

A. Using DSTB

Before any terrain analysis functions can be performed in **DSTB**, you must first start DSTB from C2PCl. Select the **Tools** menu from an under this selection, choose the **DSTB** option (Figure 147). After the application is started, you will see the set of **DSTB** toolbars on the top of the map display. Figure 148 shows the **Main C2PC Window** with the **DSTB Injector** launched.

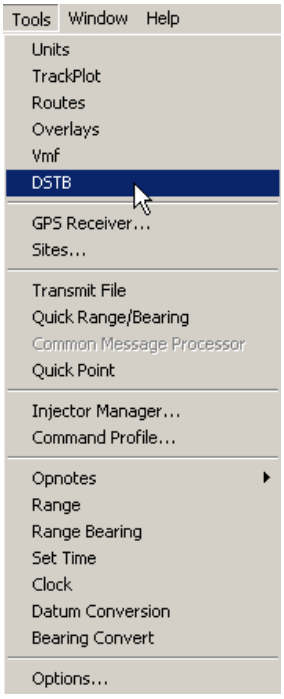


Figure 147. Accessing the DSTB Injector

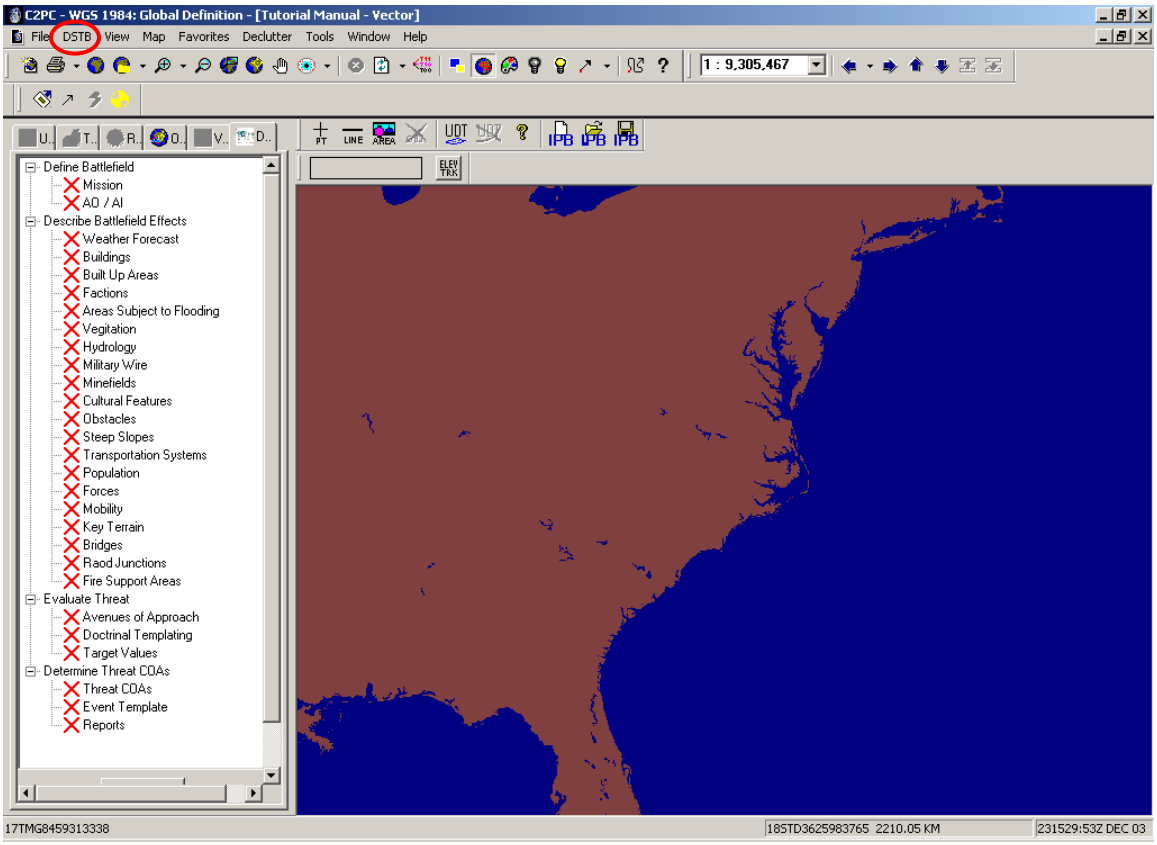


Figure 148. C2PC Main Window with DSTB Injector launched

Once **DSTB** has been selected from the **Tools** menu, the **DSTB** menu will appear on the menu bar, Figure 149.

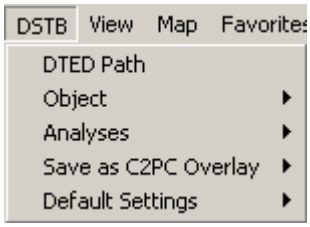


Figure 149. DSTB Menu

Figure 150. DSTB Toolbar

1. Setting Digital Elevation and Terrain (DTED) Data Paths

The process of setting the **DTED** (maps with all the terrain information) path is exactly the same process as the one discussed on in the Maps section. Similar interface will appear for the selection of directories.

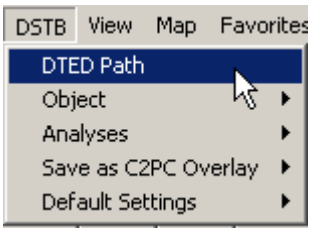


Figure 151. Setting the DTED Path

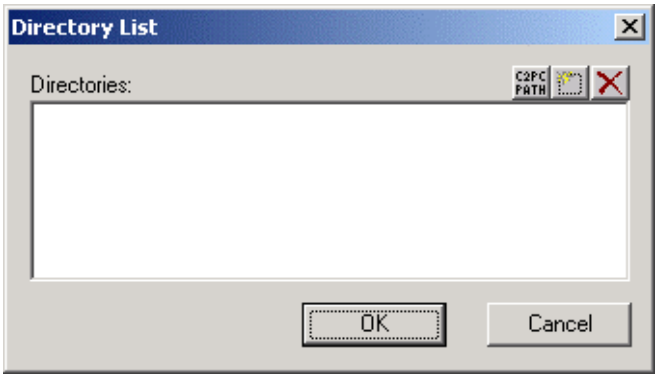


Figure 152. Directory List Dialog to set DTED Paths

Figure 151 shows the Directory List window. To add a directory to the list, click the button. To remove a directory from the list, click the button. To import the directory used by C2PC in the **Map Data->Data Paths** dialog, click the C2PC PATH button.

2. Making the Analysis

The first step performing an analysis is to place an analysis objects on the **C2PC map display** using the **POINT**, **LINE**, or **AREA** buttons on the **DSTB** toolbar (Figure 149). To place the **Analysis Objects**, the user simply clicks on the appropriate button (Figure 150), and then places the mouse cursor at the desired location on the **C2PC map display** and clicks on the map. This will drop the object on the map. Depending on the type of analysis you are conducting, the object placed on the map window will take a different appearance:

- A point object will appear as a cross
- An area object will appear as a rectangle
- A line object will appear as a line

Initially, the object will be red in color. This indicates the object is currently selected. Next you will use one of the analysis functions on the **DSTB dropdown menu** (Figure 151) or objects context menu to perform the analysis. When the analysis is finished, the results will appear on the map display. After you are done with the analysis, you can delete the analysis by clicking on the appropriate remove button on the analysis GUI.

The **Remove** button will delete the object from the map window. Another way to delete the object is by right click while the object is selected and select **Delete**.

a. Point Analysis

By placing a point analysis object on the C2PC map display, you can perform two types of analysis: **Range Rings** and **Line of Sight**.
The first step in using line of sight is to designate a point on the map using the Point button 

or by selecting **Object: Point** on the DSTB menu. Once the point has been designated, the point will be in the form of a white X. If the user desires, by left clicking the X it can be dragged to another position. When the point is not active it will turn red.

i. Line of Sight

In order to select the LOS analysis, while having the inserted point selected, you can go the DSTB menu (Figure 153), or right click the mouse and select Line of Sight (Figure 154). You can choose from two kind of LOS analysis, Ground LOS (Figure 155) or Air LOS (Figure 156). You can set a range up to 32000 meters from the designated point in the LOS range box. This input can be changed in 100-meter increments. The sensor above ground level (AGL) for the Air LOS tab is, as an example, a radar that is on top of a vehicle emitting from the specified point. The ground Target AGL is any equipment sitting above the DTED data that has been loaded. The higher the sensor is, as well as ground target that is within the LOS radius, further enhances detection.

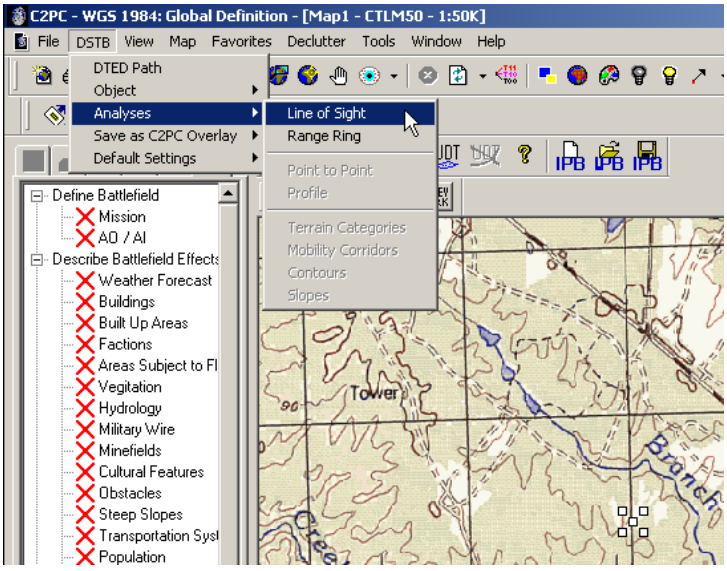


Figure 153. Selecting the type of analysis using the DSTB menu

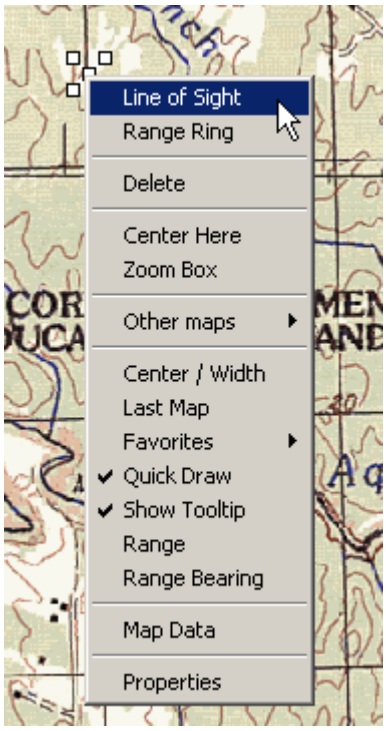


Figure 154. Selecting the type of analysis by right-click the mouse

Once the line of sight range has been set, click the **Run** button. A green grid area will appear around the point out to the range designated to indicate line of sight based on elevation of the designated point and surrounding terrain. Figure 157 shows an LOS with a radius range of 2500 meters.

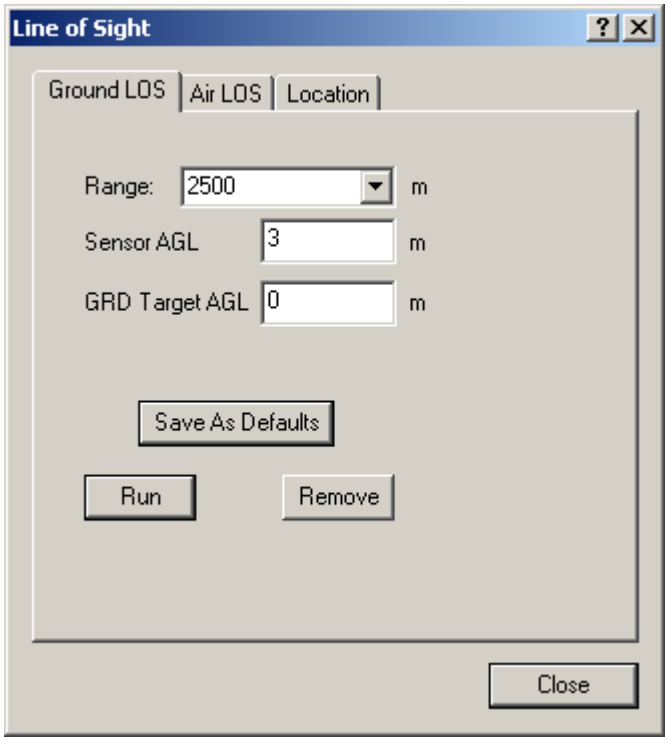


Figure 155. Ground LOS tab

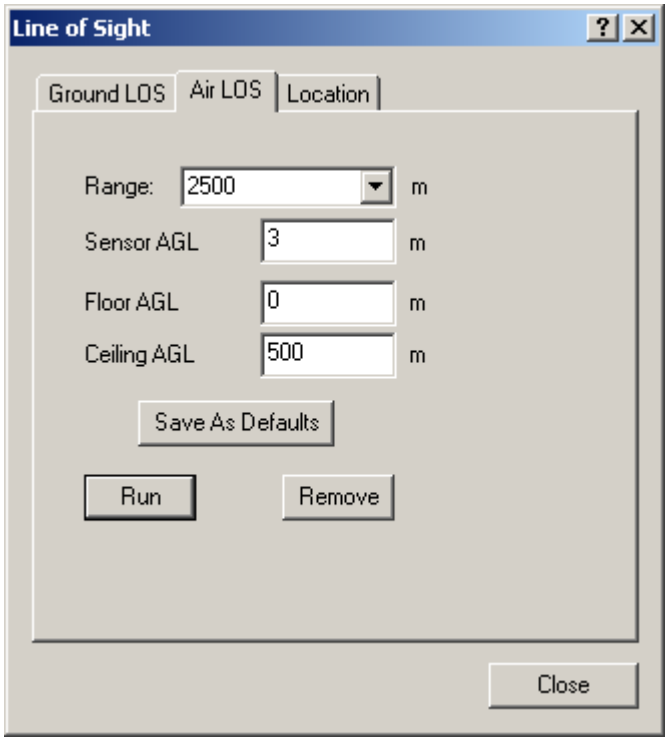


Figure 156. Air LOS tab

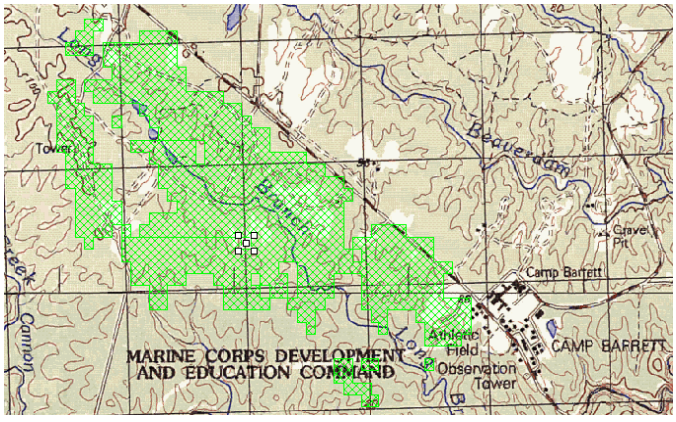


Figure 157. Ground Line of Sight Analysis Result

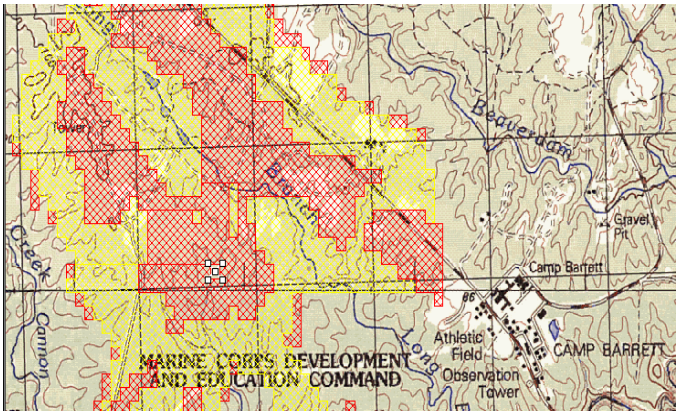


Figure 158. Air Line of Sight Analysis Result

As shown in Figure 158, the sensor (threat radar) is at a height of three meters. The area of coverage is from 0 to 500 meters above ground level. The red area indicates LOS

detection. The yellow area indicates possible or no indication of LOS detection. The maximum ceiling altitude that can be set is 1000 meters.

ii. Range Rings

Range Ring analysis is a time distance factor based on Unit type, speed and slope originating from a central point. Like the Line of Sight analysis, you need to have a point on the map in order to create a Range Rings analysis.

Select **DSTB → Analyses → Range Ring**. You will get a window like Figure 159. In that window you can specify the total time for the analysis and the time interval that you will like to show in the analysis. The **Time Interval** will dictate how many range rings will show on the analysis. **Unit Type** will dictate how far a unit (Infantry, Armored Type 1, Armored Type 2 and Wheeled) can travel based on default speeds versus degrees of slope considerations (Figure 160). The **Percent of Max Speed** allows the operator an overall speed control based on other variables outside of DTED data. This will have an impact, for example, for weather conditions where you know that the mobility will be reduced even though they are traveling on unrestricted terrain.

The parameters on the **Mobility Rates** tab can be adjusted. Selecting **New Unit Type** in Figure 160 to add a new specific unit category that can be built based on capabilities of the type equipment the unit has.

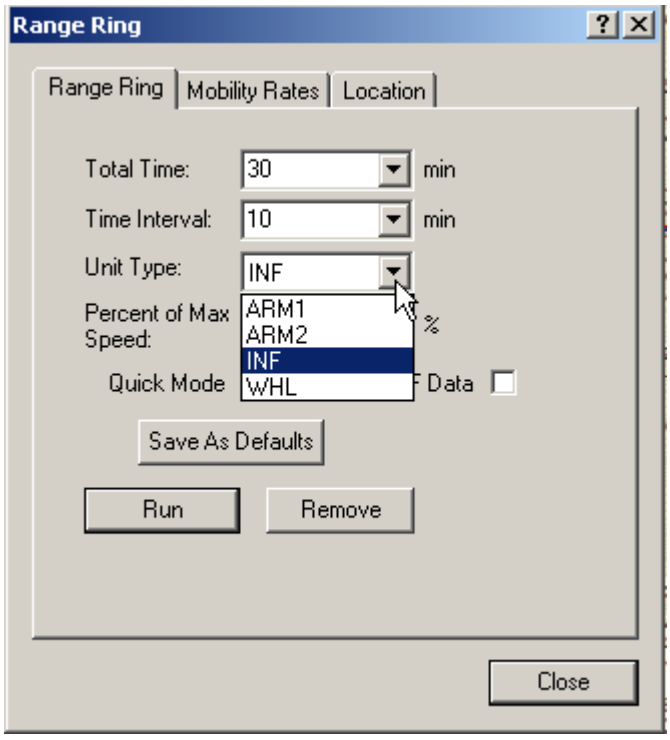


Figure 159. Range Ring tab

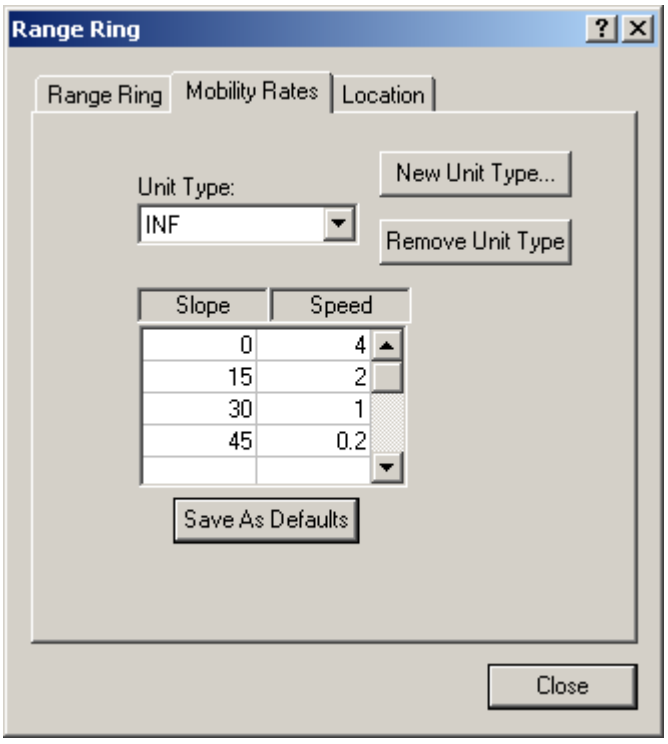


Figure 160. Mobility Rates tab

NOTE: The percent of maximum speed has overall impact on all speeds in the mobility rates.

Figure 161 shows a mobility analysis of an infantry unit with a total time of travel of 30 minutes (this parameters were set at Figure 159). Each interval represents 10 minutes of time traveled.

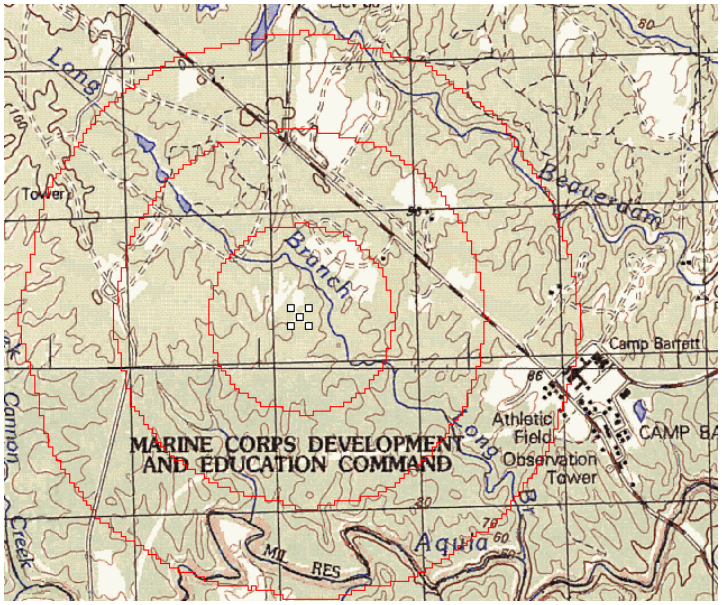


Figure 161. Range Ring Analysis Result

b. Line Analysis

In order to perform this kind of analysis you need to have a line object on the map window. This line is basically your desire movement from one point to another. Select the line button 

from the tool bar or go to **DSTB → Object → Line**. Place a line just the same way as creating a line for an overlay. Upon placing a line on the map you can select the type of analysis by using the menu **DSTB → Analyses** or while the object is selected by right click). This provides for two specific tools: **Point-to-Point** and **Profile**. The **Point-to-Point** tool provides for time distance data. The **Profile** tool provides an elevation scale window.

i. Point to Point

Once you have a Line object on the map you can perform a **Point to Point** analysis. When **Point to Point** is selected the window shown in Figure 163 appears. Like the previous analysis it has three tabbed areas: **Point to Point**, **Mobility Rates** and **Location**. Notice that information asked in these tabs are exactly the same as the **Range Rings** analysis. Follow the same procedure previously discussed in order to fill the necessary information.

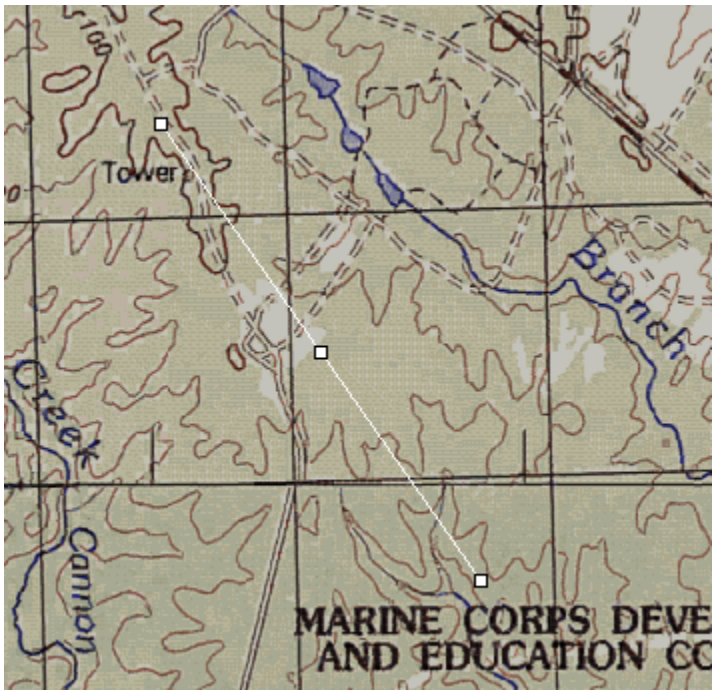


Figure 162.Line Object for Line Analysis

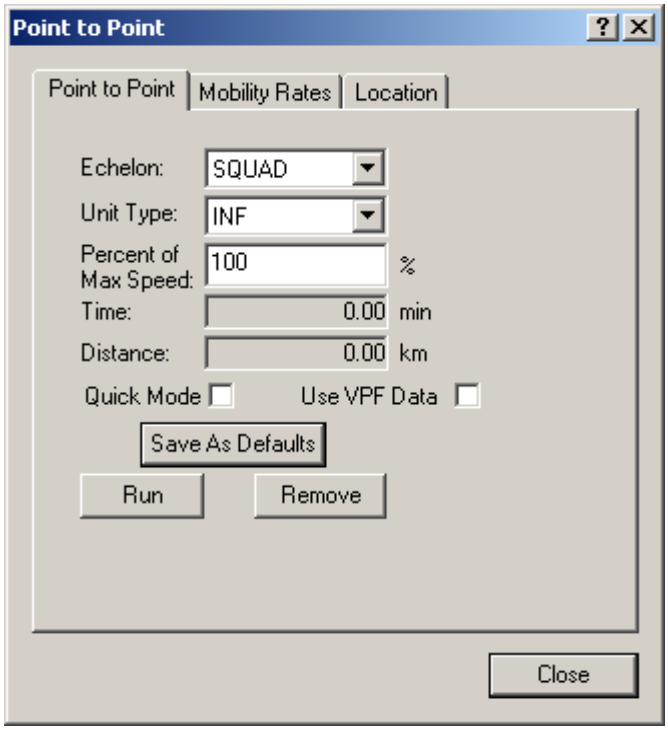


Figure 163. Point to Point analysis window

When ready, click run to start the analysis. DSTB will start looking for the best possible route for the type of unit selected, the mobility information provided and on top of all base on the terrain. Figure 164 and 165 show the final result. Figure 165 shows a kind of polyline created by DSTB. Based on terrain that is the best path for the movement. Notice that in Figure 163 the Time and Distance information are shown to be zero. After the analysis Figure 165 shows that the time to complete the movement from the starting point to the ending point is 33 minutes and 23 seconds and the total distance travel is 2.16 kilometers.

ii. Profile

The **Profile** analysis provides an interactive graphic depiction of distance versus elevation (Figure 166). Wherever the mouse is moved along the graph line, the location will be indicated in the **Location** box. Based on the complete route, the highest and lowest points, total distance, greatest slope along route and difference in meters between highest and lowest point are shown. The plus (+) and minus (-) buttons allow the user to zoom in and out of the distance scale. The arrows allow the user to continue past the end point to display graphing for elevation.
The **Properties** tab allows the user to decide what data will be displayed in the map window. If **Auto Scale** is deselected, the Horizontal and Vertical Scales can manually be changed.

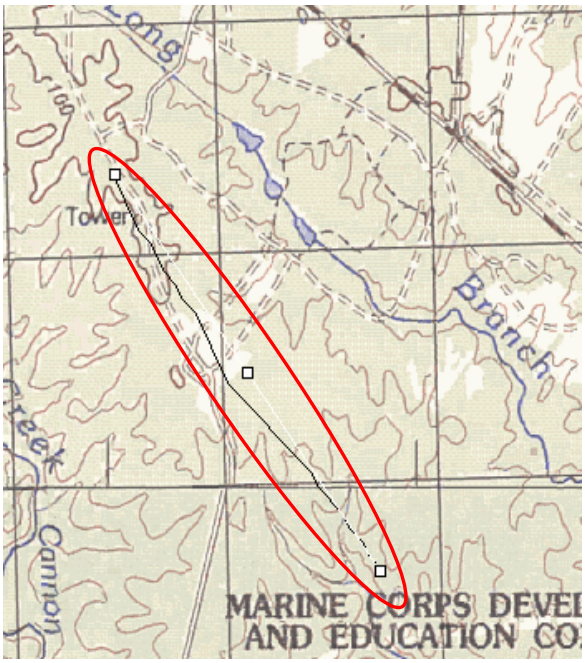


Figure 164. Point to Point Analysis Result

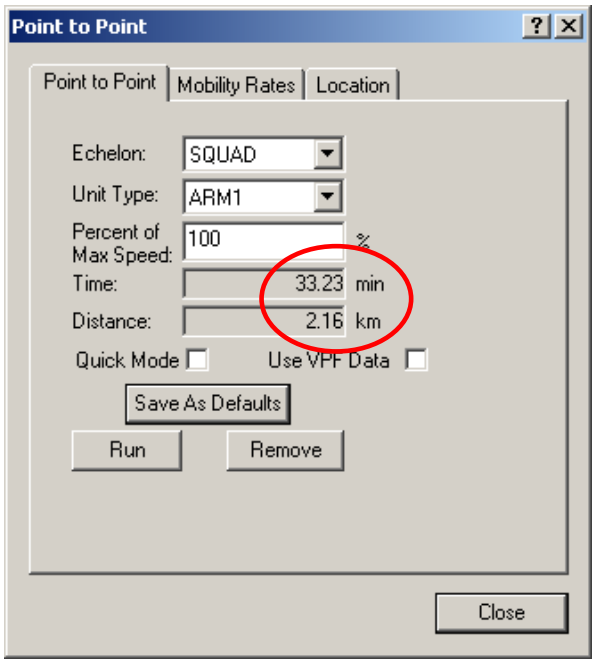


Figure 165. Point to Point Time and Distance Result

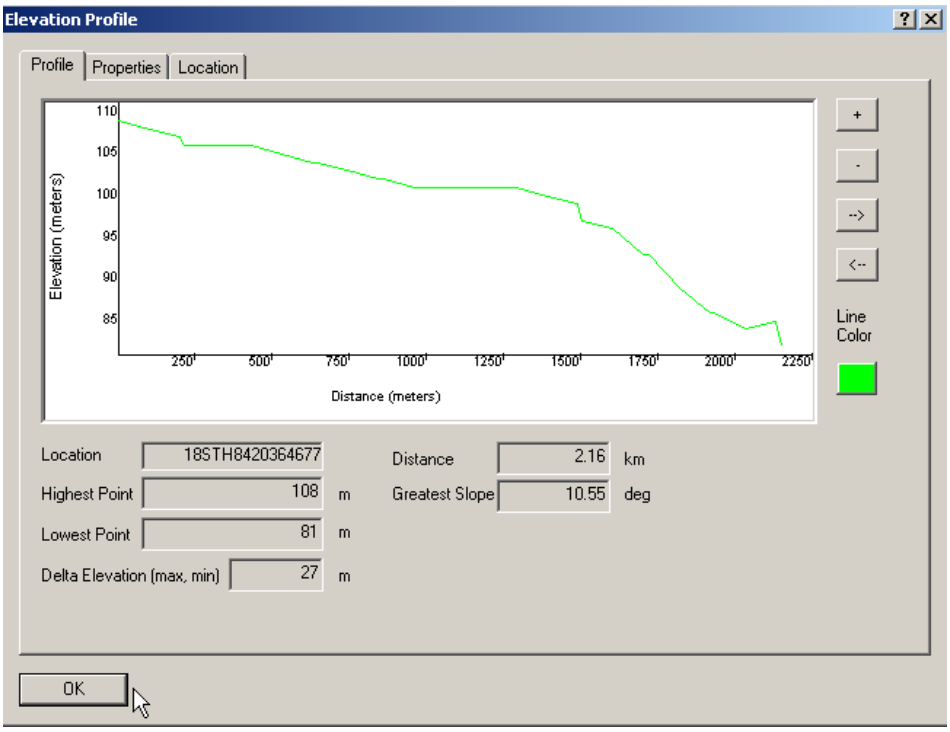


Figure 166. Point to Point Analysis Profile

c. Area Analysis

Area analyses allow you to perform terrain categorization of a box-shaped area on the C2PC, identify mobility corridors within the terrain categorization, and display an elevation contour map of the area within the box. The functions within area analysis allow the user to build portions of a Multiple Combined Obstacle Overlay (MCOO) along with other applications within DSTB. The primary functional applications within area analyses include:

- Mobility Corridor
- Contours
- Slope
- Terrain Categorization

In order to start performing an **Area Analysis** you need to establish the desire are to perform the analysis. Click the Area icon 

on the DSTB menu or select **DSTB** → **Object** → **Area**. Left click in the map and while keeping the left mouse button pressed drag the upper left to lower right corner of the box for the desired area. While active, the rectangle can be compressed or expanded by the corner control points. The center point moves the whole rectangle. Once the area has been designated, select **DSTB** from the main menu bar and then the desire analysis from the submenu (Figure 167) or by right clicking the mouse to obtain the context menu.

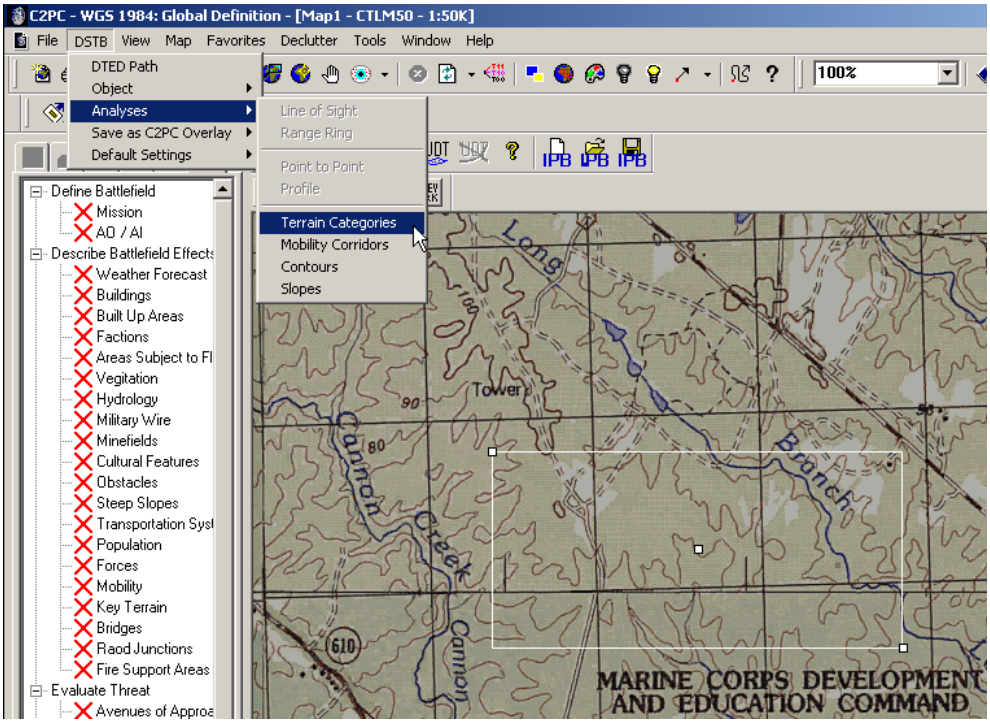


Figure 167. Performing Area Analysis

i. Mobility Corridors

By selecting **Mobility Corridor** analysis, in the first tab you can identify the size echelon and direction that a mobility corridor(s) can be identified. You have the option to select or assign a specific color for the different echelon of movement by clicking by the color (Figure 168). Figure 169 shows a platoon size unit mobility corridor computed by DSTB.

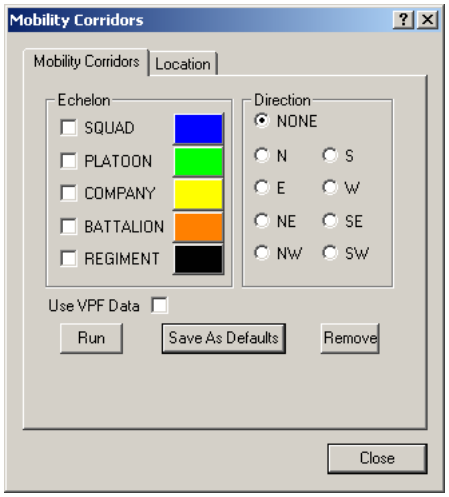


Figure 168. Area Analysis Mobility Corridor

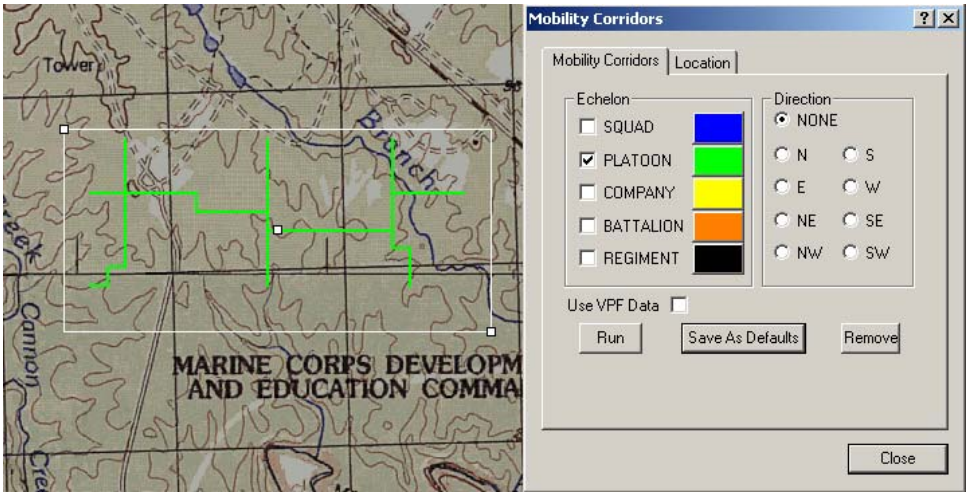


Figure 169. Area Analysis Mobility Corridor Results

ii. Contours

In a selected area you can show a graphical analysis of the contour of the selected land area. By default, DSTB sets the maximum and minimum contours of the area. The user selects the increment in which the individual contours will be delineated. In Figure 170, the contours are set to display every 5 meters of contour change. The colors delineate the changes in contours. By default, DSTB sets the colors to gradually change from a dark low contour to a bright high contour; however, the contours can be modified according to user preference. You can select the **Use Increment** button for increment changes to take effect.

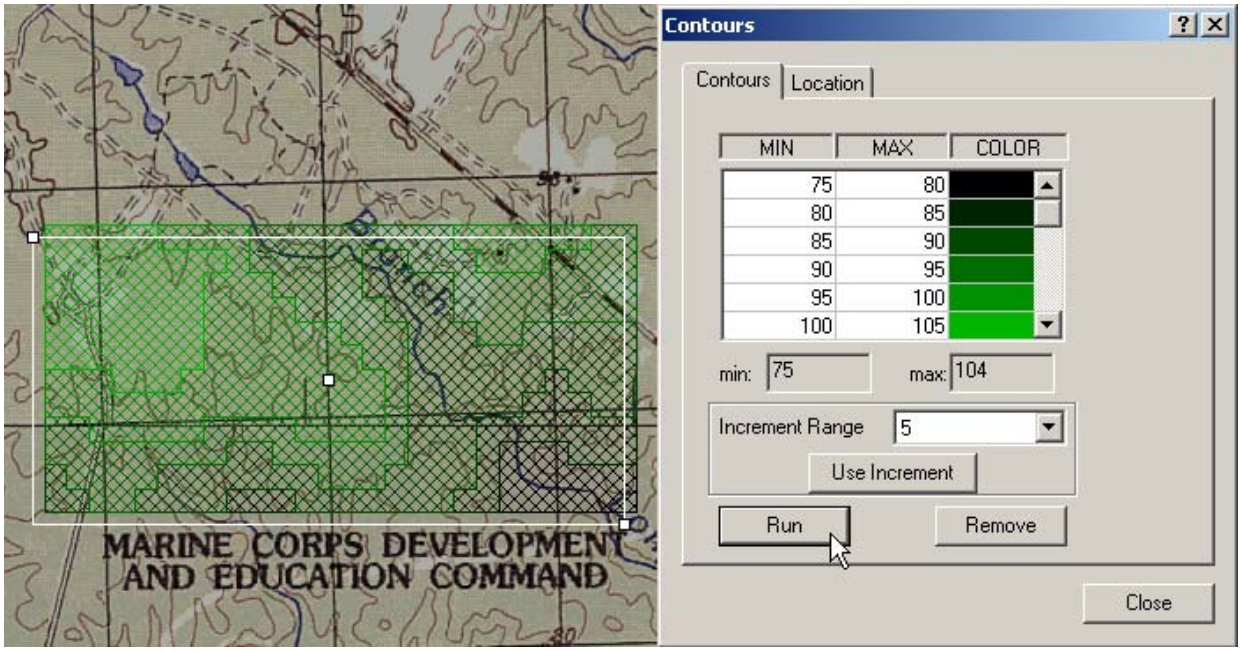


Figure 170. Area Analysis Contour Analysis Results

iii. Slopes

Slope analysis acts almost the same in functionality as terrain categorization. You can change each individual color and degree of slope range (Figure 171). The slope incremental range can also be changed.

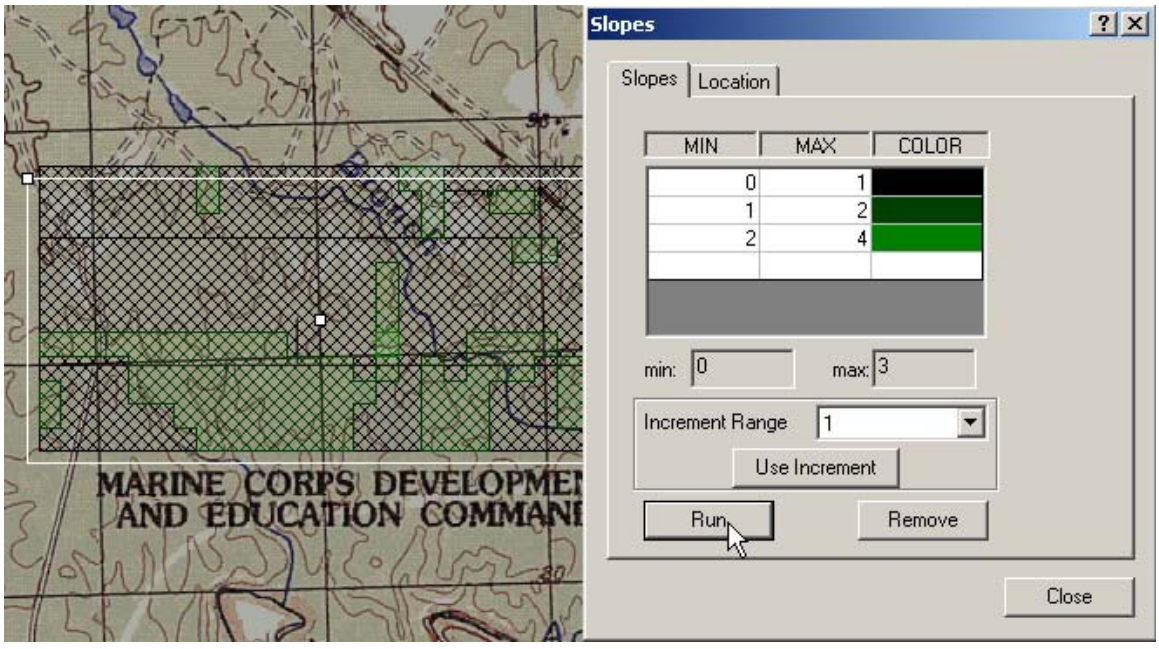


Figure 171. Area Analysis Slopes Results

iv. Terrain Categorization

This tool allows you to color code the terrain in the four categories of unrestrictive, restrictive, severely restrictive and impassable (or commonly known as go, slow go and no go). As shown in Figure 172, the user can change the degrees of slope and the color of each respective category. The map will remain clear for areas of unrestrictive terrain. A direction may be selected to produce a categorization on compass heading such as south to north or east to west.

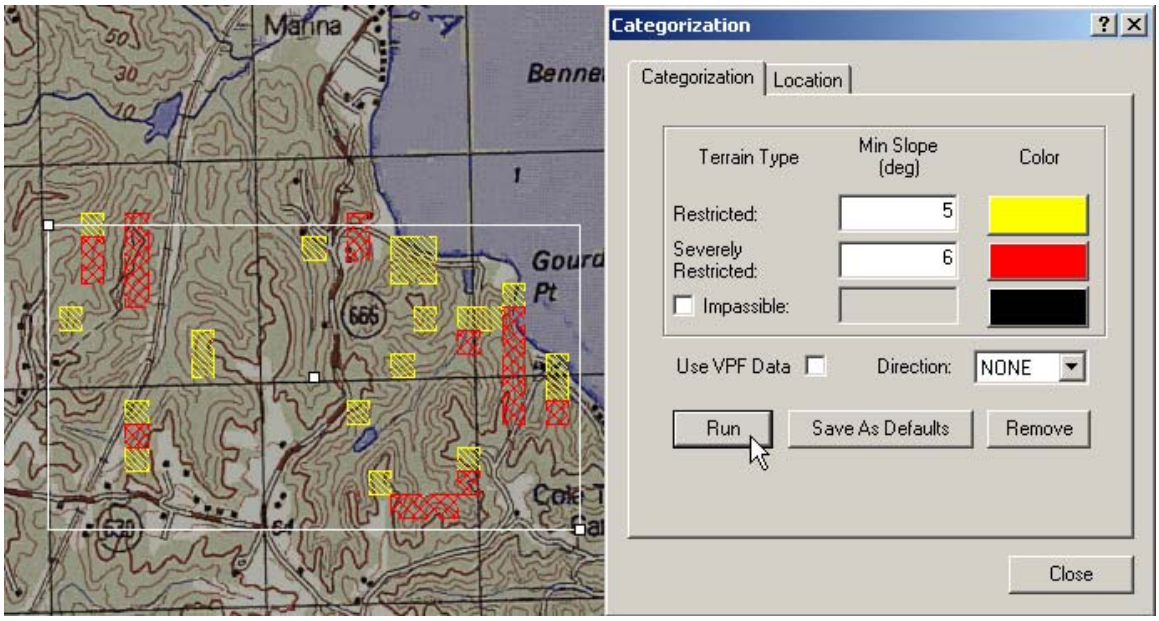


Figure 172. Area Analysis Terrain Categorization Results

In Figure 172 anything that has a slope of five degrees is restricted and six degrees and above is severely restricted.

d. User Defined Terrain

The **User Defined** 

option allows you to create personalized areas that not necessary are tied up to terrain. These areas can be categorized by you as restricted or severely restricted as part of the MCOO creation. DSTB will take into account these areas when creating optimize routes. The creation of a **User Defined Area** is exactly the same as creating a polyline.

The **Delete UDT** button 

will remove the designated area while the area is selected.

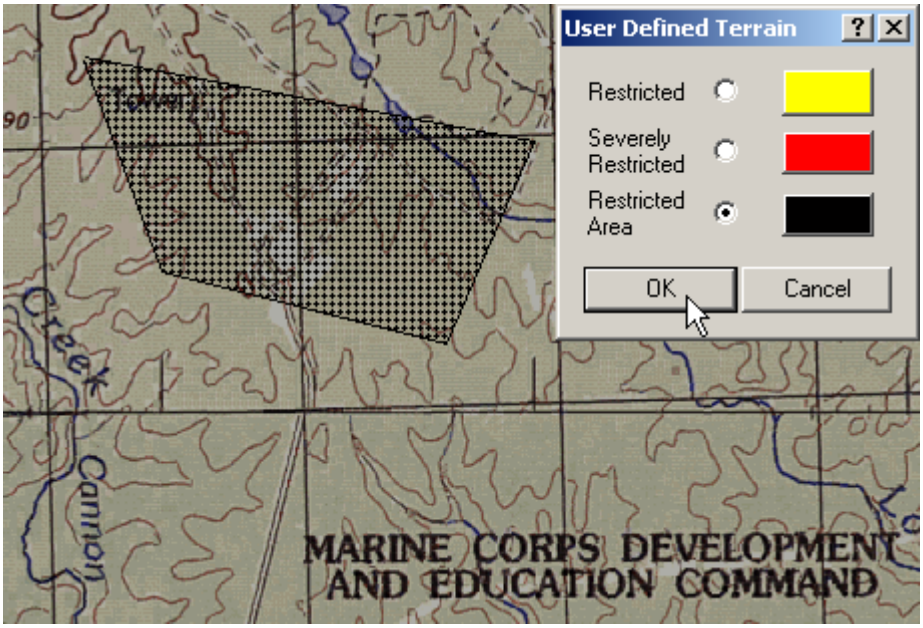


Figure 173. User Defined Terrain

e. Saving the Analysis as C2PC Overlays

Any products produced by the sub area applications can be transferred over to the overlay file folder (Figure 174). Select **DSTB** on the main menu bar and then select **Save as C2PC Overlay** from the menu. Next, click **Analysis Results**.

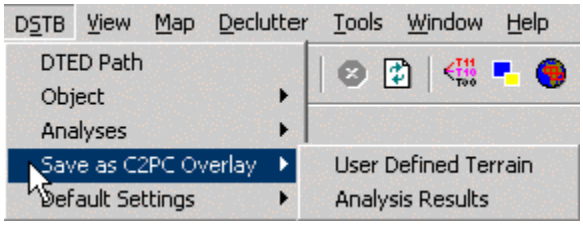


Figure 174. Saving Analysis Results as C2PC Overlays

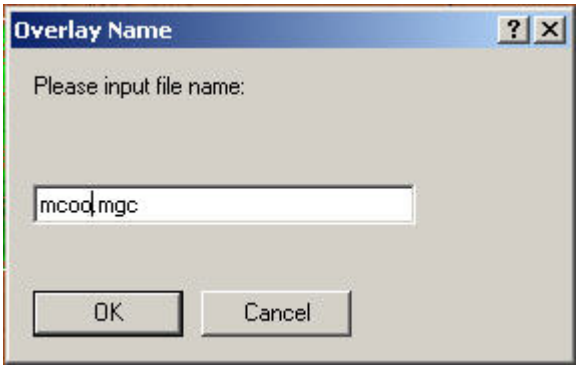


Figure 175. Naming the Analysis Results

Upon selecting **Analysis Results,** provide a name for the file (Figure 175) and it will be placed in the main overlay file folder.

Note: When saving an overlay to an output file (Figure 175), leave the .mgc file extension to ensure operability

VII. C2PC and the OPT

MCDP-5, *Planning*, says that arguably Course of Action Development (COA Dev) is the most difficult step in the Marine Corps Planning Process (MCPP). That is because it is here where planners translate the Commander's guidance, intent, vision of the Mission, Friendly and Enemy Forces, into options that will create COAs that can be taken into the Wargaming process. You are translating guidance, intent into graphics.

In the past the use of a paper map, plastic sheet and a grease pencil was our way to create overlays. A process that was lengthy and tedious since it needed to be done more than once in order to have multiple COAs for Wargaming. What is different? Basically the process is still the same, the information that needs to be collected is still the same. We start from the Commander's intent and work our way to COA development. These days the tools to create overlays and tools to help the OPT members to make decisions to support actions translated into an overlay are different.

C2PC provides several tools that expedite the process of COA development. Used from the early stages of MCPP, C2PC can provide information like how big is your Area of Operation (AO) and help in the creation Intelligence Preparation of the Battlefield (IPB) and its products. Overlays can easily be shared within the C2PC network so other sections or either subordinates unit can use them.

A. Developing COAs using C2PC

C2PC provides several tools that can be used in the Course of Action development. From **Range** and **Range/Bearing** to **Operational Symbols**, C2PC tools can expedite the process of developing COAs. One of those tools is Decision Support Toolbox.

The **Decision Support Toolbox** allows you to import, manipulate, and analyze terrain data in order to gain a better understanding of the effect of terrain on operations (Figure 176).

DSTB assists in performing terrain categorization (**Restricted**, **Severely Restricted**, **Impassible** or as we know them **Go**, **Slow Go** and **No Go**), finding high speed mobility corridors for tactical movement, determine travel times for routes, Line of Sight, and much more.

These tools are very useful in the creation of IPB products and therefore leading to the creation of Course of Actions. IPB products like the Modified Combined Obstacle Overlay (MCOO) can be created in order to facilitate the development of COAs. C2PC can easily be used to depict all obstacles to mobility. Obstacles like swamps, urban areas (that wants to be avoided), vegetation, and terrain are shown in this graphic. All this products of different DSTB analysis can be merged into one overlay and show all the obstacles that could restrict the mobility of units (MCOO) (Figure 177).

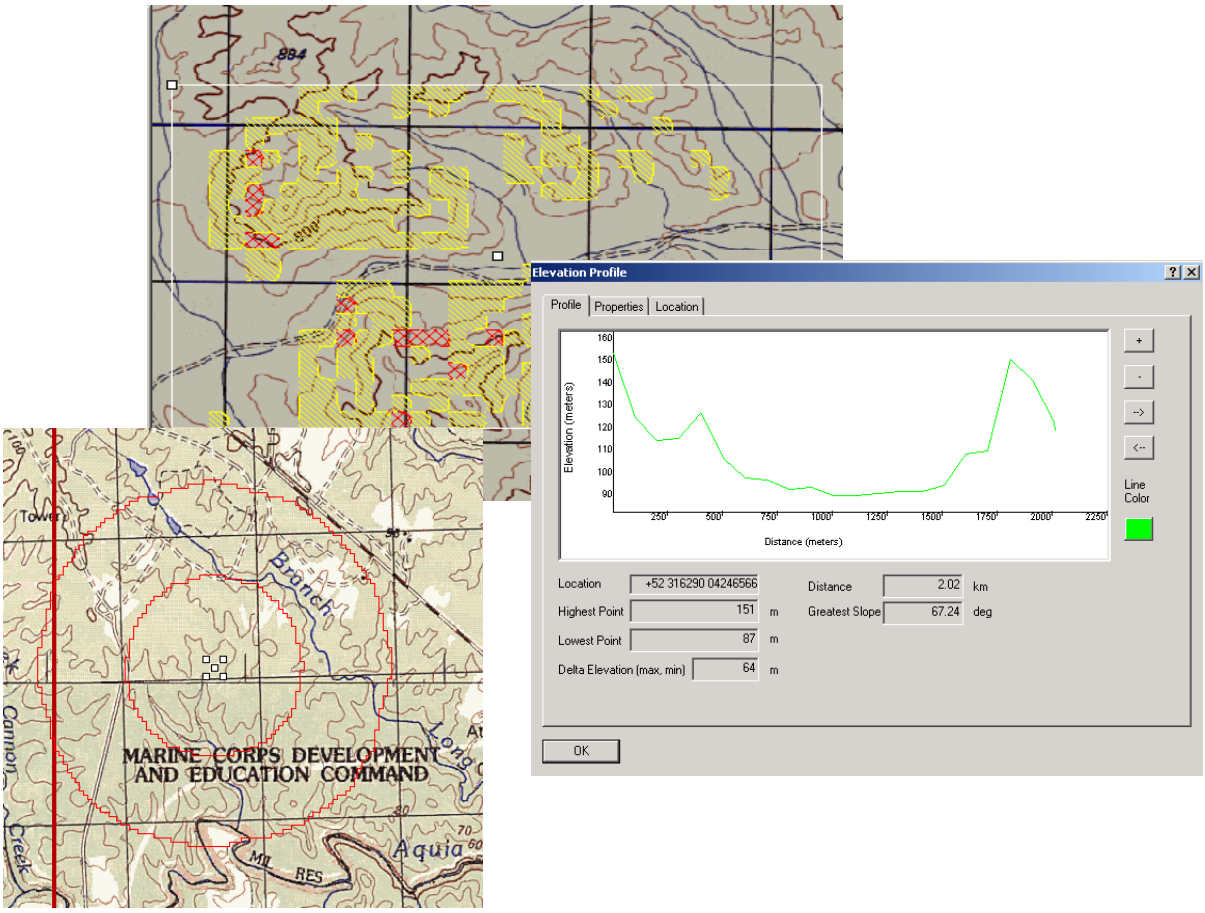


Figure 176. Some Products created by DSTB

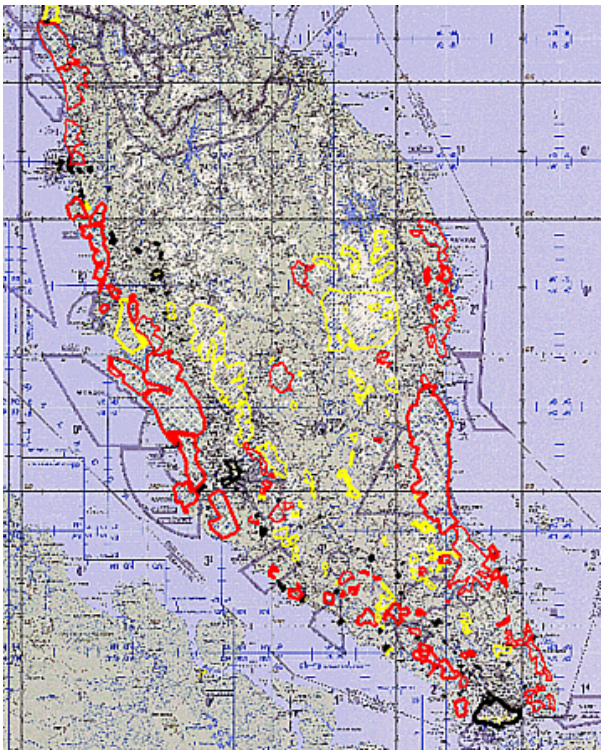


Figure 177. MCOO creation using C2PC

You can perform calculations of time to transient between the two points and the distance. C2PC can also provide you the elevation profile along that path. By placing a point analysis object on the C2PC map, you can perform a range rings analysis. This analysis shows how far a unit can move from a certain point within a given amount of time. Based on the type of mobility selected the distance will vary. The nature of the terrain will also determine how far the unit can go in a given time (Figure 178).
C2PC can be used to depict the current situation in order to provide a frame of reference to start developing the different courses of action. You can even use this overlay to draw operational graphics on top of it as the COAs. This current situation can be extracted by creating an overlay out of the current COP, in other words, using the existing tracks coming out of the IOS and transmitted to C2PC (Figure 179).

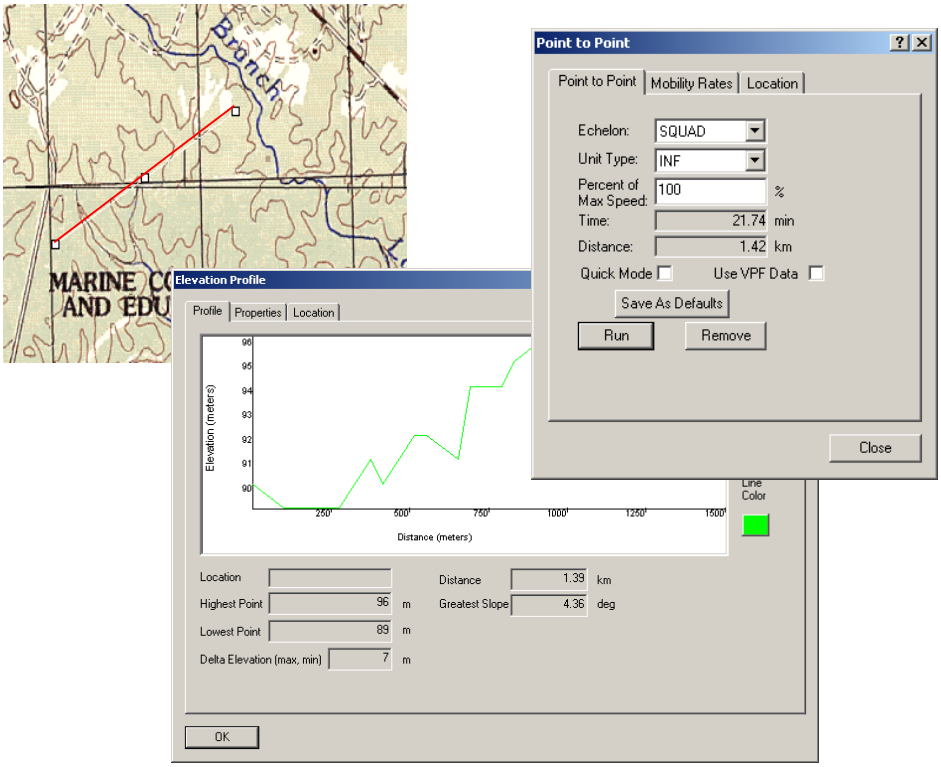


Figure 178. Mobility Analysis in support of COA development

Why do we want to develop COAs in C2PC? In the past the method of creating overlays was the paper map and of top of it a plastic sheet in which it was used to create the overlay with a grease pencil. Everything was drawn in that overlay. Once we had developed one COA then you had to start from the beginning in order to create a second and a third one, a very tedious and time consuming process.

C2PC provides the flexibility of creating overlays and editing at the spot with immediate results. Once the entire process of COA development is done, the issue of the orders can be accompanied with the overlay to graphically represent what is written and better understand the entire concept of maneuver and operation.

Multiple Courses of Actions can be developed in an easy and rapid form. With a snap-shot of the current situation based on the Common Operational Picture as a starting point, it is just a matter of adding operational graphics into that overlay. Once that COA overlay is finished, is just a matter of copy, paste and modify in order to create a second and third COA (Figure 180).

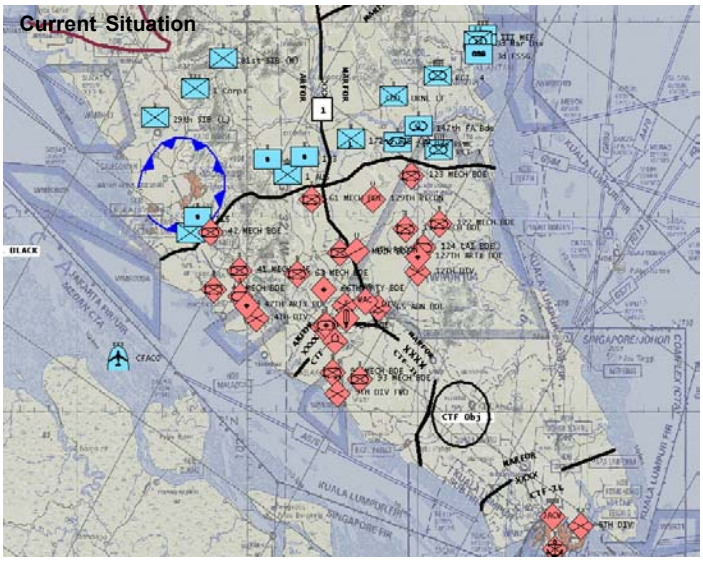


Figure 179. Depicting Current Situation

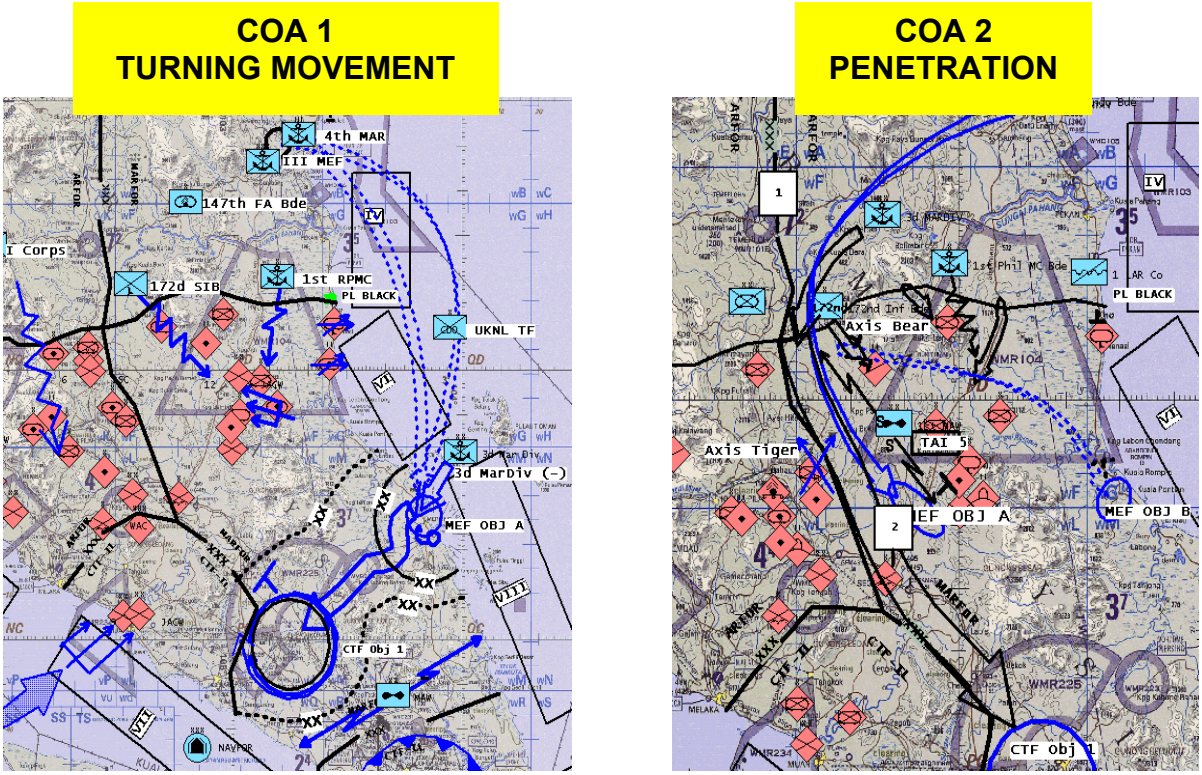


Figure 180. Multiple Courses of Action Creation with C2PC

B. Collaborative uses of C2PC

1. Sharing Overlays

Once you have your COAs or selected COA after the wargaming and decision making process, you can share that product among the Staff Officers, OPT members, Senior Watch Officers and other Watch Officers using the C2PC network. This procedure was discussed on the sub-section ***6. Sharing Overlays*** of section **A. Using Overlays** of chapter **V. Using C2PC**.

VIII. C2PC and Situational Awareness

A. Customizing the View by Using Filters

Use this option to determine the way tracks plot in the map window. Tracks can be set to automatically appear or not based on some of their attributes. The size of track symbols can be set to appear larger or smaller.

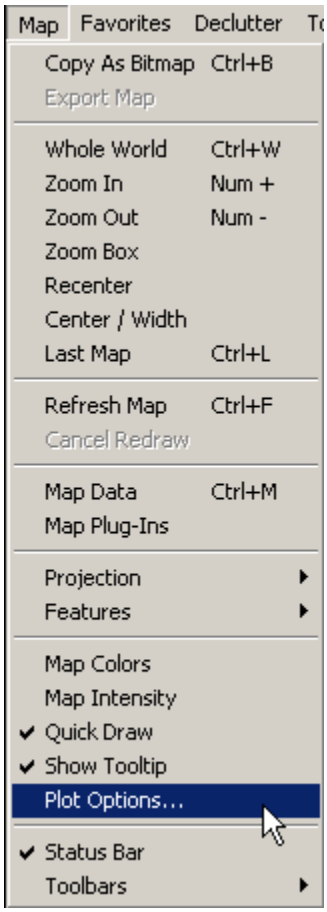
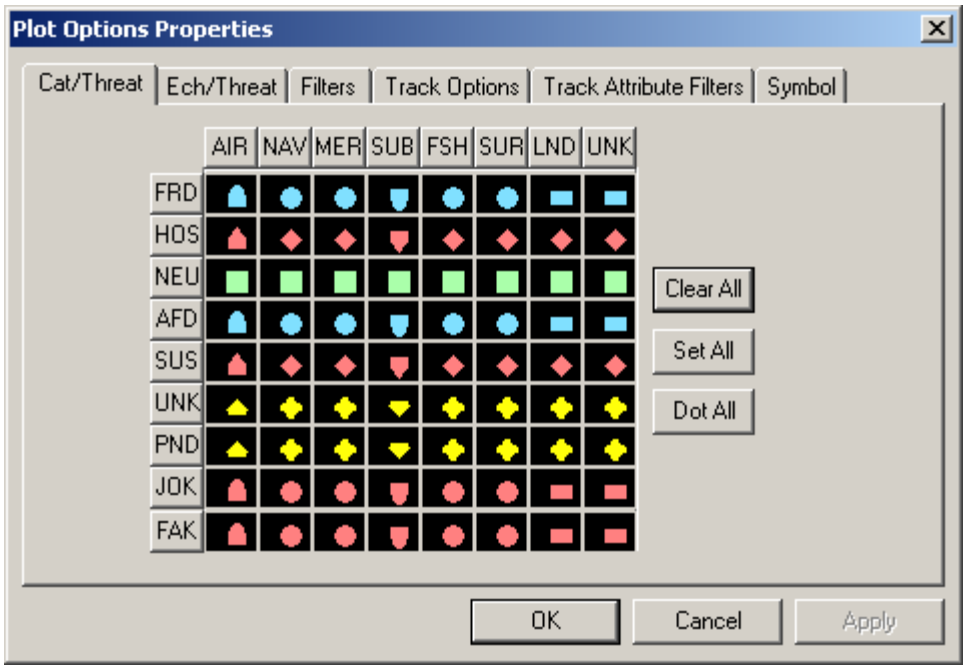


Figure 181. Using Plot Options to customize the C2PC view

Choose **Plot Options** (Figure 181) to display the **Plot Options Properties** window (Figure 182).

The Plot Options Properties window contains six separate folders - Cat/Threat, Ech/Threat, Filters, Track Options, Track Attribute Filters, and Symbol. Click on one of these tabs to view the plot settings available in that folder.



NOTE: these display options do not affect tracks which are part of a track group.

Figure 182. Plot Options Properties window

1. Cat/Threat

The **Cat/Threat** tab (Figure 182) allows you to use track category and track threat to determine which tracks to display. This view is the default view after selecting **Plot Options**.

The display choices are to display the track symbol, display the track as a dot, or turn off display of the track. Use the **Track Category** buttons across the top and the Threat buttons on the left to specify the type of tracks you want displayed. Click a **Track Category** button to toggle a column of selections, click a **Threat** button to toggle a row of selections, or click an individual checkbox to toggle an individual selection. Clicking a row, column or individual selection toggles the selection between display on, display as dot, and do not display.

Click the **Clear All** button to toggle all checkboxes off. Click the **Set All** button to toggle all checkboxes on. Click the **Dot All** button to change all the track symbols to dots.

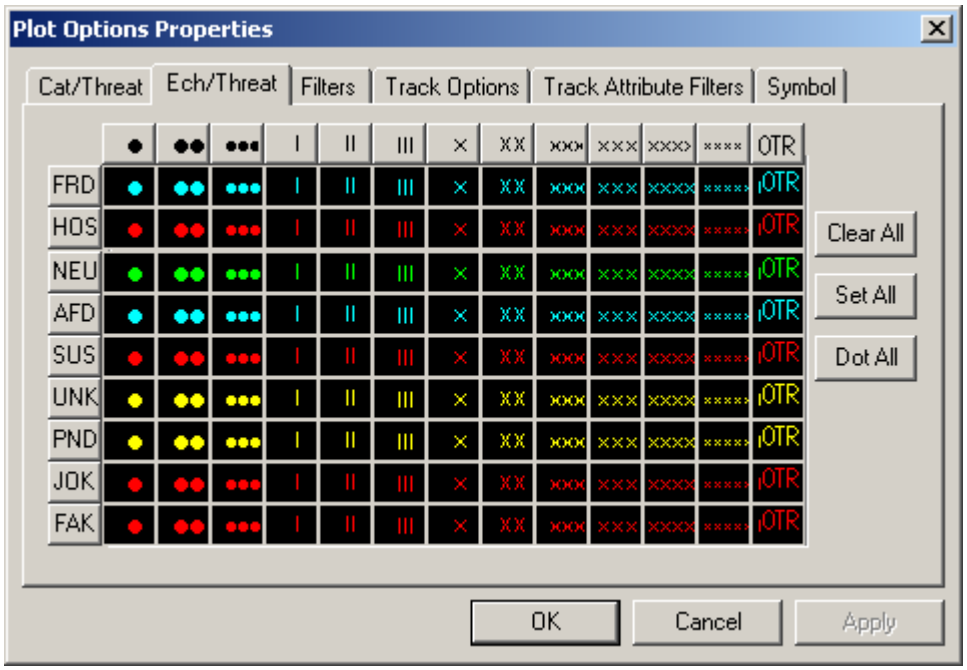
Click the **Apply** button to accept any changes to the checkbox settings and remain in the **Plot Options Properties** window. Any changes made to the checkboxes are reflected in the display of tracks in the map window and to tracks in the track list.

Click the **OK** button to accept any changes to the checkbox settings and exit the Plot Options Properties window.

Click the **Cancel** button to discard all changes made since the last time the **Apply** button was clicked and exit the **Plot Options Properties** window.

2. Ech/Threat

The Ech/Threat tab (Figure 183) allows you to use echelon level and track threat to determine which tracks to display.



NOTE: these display options do not affect tracks which are part of a track group.

Figure 183. Ech/Treat Tab

Use the **Echelon** buttons across the top and the **Threat** buttons on the left to specify the type of tracks you want displayed. Click an **Echelon** button to toggle a column of selections, click a **Threat** button to toggle a row of selections, or click an individual checkbox to toggle an individual selection. Clicking a row, column or individual selection toggles the selection between display on, display as dot, and do not display.

Click the **Clear All** button to toggle all checkboxes off. Click the **Set All** button to toggle all checkboxes on. Click the **Dot All** button to change all the symbols to dots.

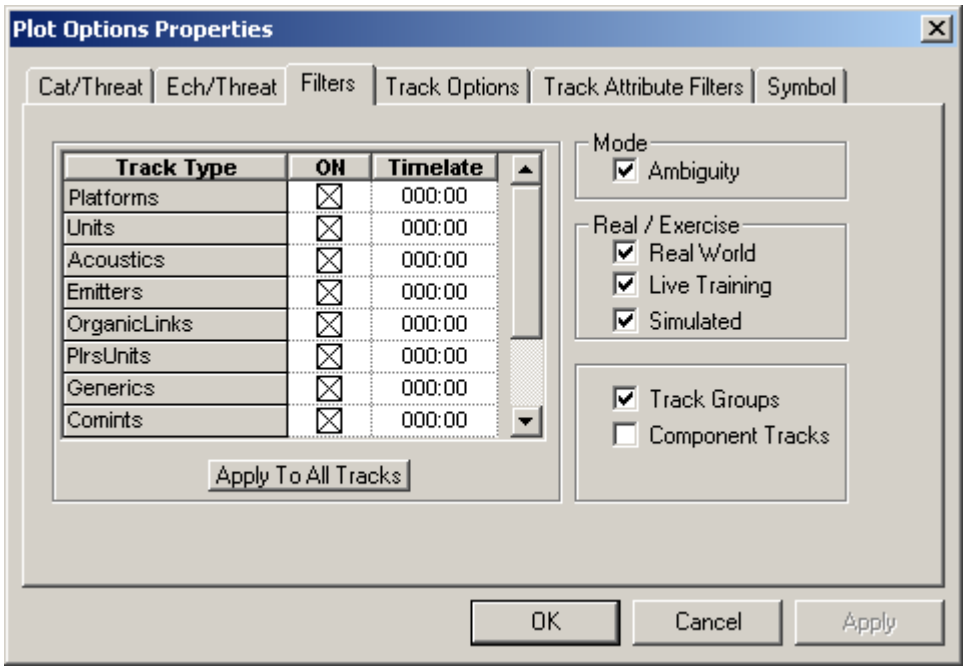
Click the **Apply** button to accept any changes to the checkbox settings and remain in the **Plot Options Properties** window. Any changes made to the checkboxes are reflected in the display of tracks in the map window and in the track list.

Click the **OK** button to accept any changes to the checkbox settings and exit the **Plot Options Properties** window.

Click the **Cancel** button to discard all changes made since the last time the **Apply** button was clicked and exit the **Plot Options Properties** window.

3. Filters

The **Filters** tab (Figure 184) contains groups of checkboxes which allow you to turn on or off certain categories of tracks and track display features.



NOTE: Click the ON checkboxes in the Track Types box to select track types for display.

Figure 184. Filters Tab

A check mark in a box turns the category ON. There are a total of four areas in this tab. For any of the track types, a timelate can be entered in the **Timelate** column. To enter a timelate, enter the number of hours (0-999). If greater than zero, only those tracks with a timelate lower than this number will be displayed. If zero is entered, tracks will display regardless of the DTG of their last report.

For either the **ON** or the **Timelate** column, you may use the **Apply To All Tracks** button to apply the last setting entered to all the track types. For example, if you click a the Units ON checkbox to off, then clicking the Apply To All Tracks button would change all the checkboxes in the ON column to off. Example 2: If you set the Platforms Timelate to 002:00, then click the Apply To All Tracks button, all the Timelates are changed to 002:00.

Click on the **Ambiguity** checkbox to display ambiguous tracks. Ambiguous tracks are those tracks that don't correlate with any existing tracks and that don't contain enough information to be classified as a new track.

Click the **Apply** button to accept any changes to the settings and remain in the **Plot Options Properties** window. Any changes are reflected in the display of tracks in the map window and in the track list.

Click the **OK** button to accept any changes to the checkbox settings and exit the **Plot Options Properties** window.
Click the **Cancel** button to discard all changes made since the last time the Apply button was clicked and exit the **Plot Options Properties** window.

4. Track Options

The **Track Options** tab (Figure 185) allows you to set track label features, AOU on/off, and range circle on/off on a track type basis.
The **Label** column displays the label type that appears for tracks of the chosen track type in the map window. To change the label type for a particular track type, click the appropriate label cell to display a down arrow in the cell. Click the down arrow to display all the available label type choices and choose the label type you want from the list.

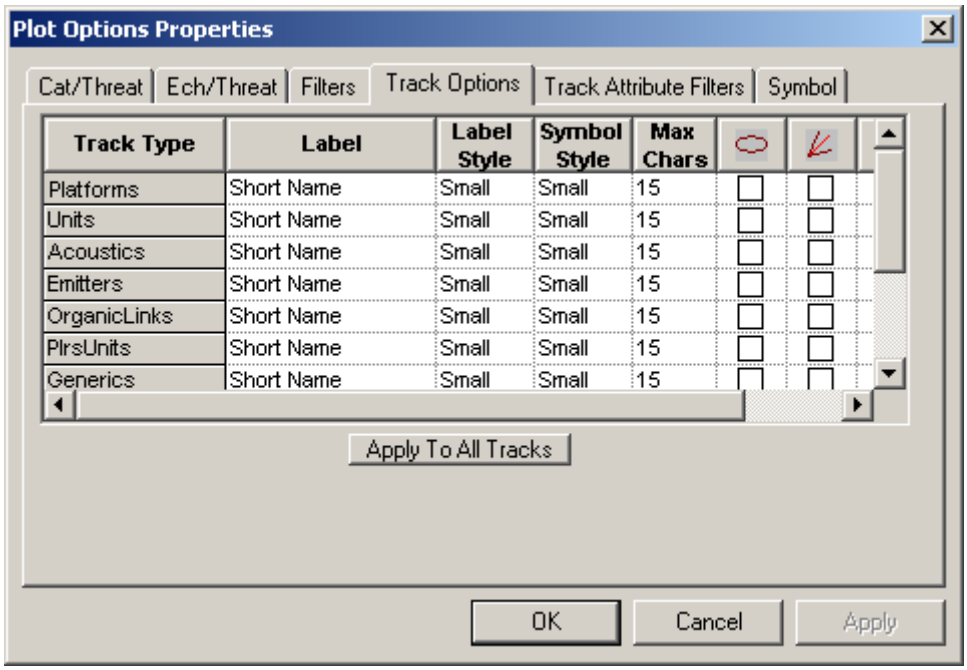


Figure 185. Tack Options Tab

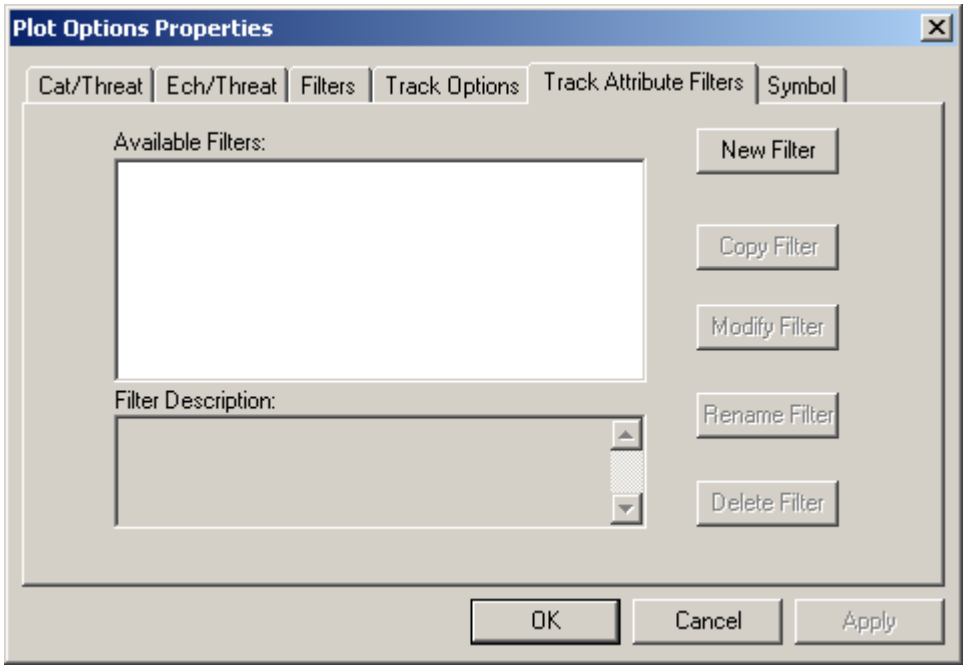
The **Label Style** column displays the label style that appears for tracks of the chosen track type in the map window. To change the label style for a particular track type, click the appropriate label style cell to display a down arrow in the cell. Click the down arrow to display all the available label style choices and choose the label style you want from the list.
The **Symbol Style** column displays the symbol style that appears for tracks of the chosen track type in the map window. To change the symbol style for a particular track type, click the appropriate symbol style cell to display a down arrow in the cell. Click the down arrow to display all the available symbol style choices and choose the symbol style you want from the list.
The **Max Chars** column displays the maximum number of characters that will display for the track labels of tracks of the chosen track type in the map window. To change the maximum number of characters, click the appropriate cell to display a down arrow in the cell. Click the down arrow to display all the available choices and choose the number you want from the list.

Click the **Apply** button to accept any changes to the values in the **Track Options** tab and remain in the **Plot Options Properties** window. Any changes made are reflected in the display of tracks in the map window and in the track list.

Click the **OK** button to accept any changes to the settings and exit the Plot Options Properties window.
Click the **Cancel** button to discard all changes made since the last time the **Apply** button was clicked and exit the **Plot Options Properties** window.

5. Track Attribute Filters

The **Track Attribute Filters** tab allows you to set filters for specific track types and their attributes. You will be building these filters to customize even more your view.



NOTE: With the Track Attribute Filter tab you can create your own filters to help you to customize your view even further.

Figure 186. Track Attribute Filters Tab

The **Available Filters** box displays a list of filters that have already been set. If the checkbox for a filter is turned on, that filter is active. If the checkbox is turned off, the filter is inactive. Select a filter from the **Available Filters** box to display a description of the filter in the **Filter Description** box.
To set a new filter, click the **New Filter** button (Figure 186) to display the **Track Attribute Filter Wizard** 1 of 4 window (Figure 187).

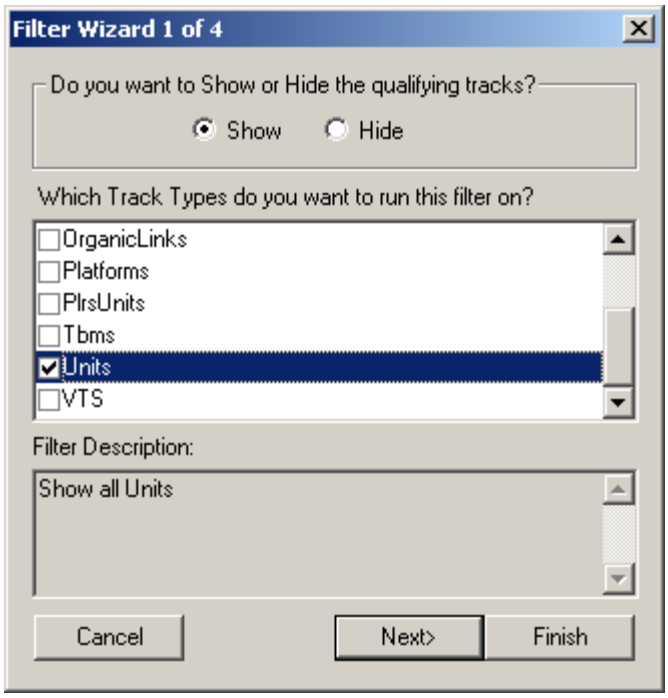


Figure 187. Filter Creation Wizard (type of tracks)

On the **Track Attribute Filter Wizard** (Figure 187), click on the checkboxes for the track types you wish to filter and click either the **Show** or **Hide** button to specify whether those tracks should be shown or hidden with this filter.
When at least one track type is chosen, the **Next** and **Finish** buttons become active. If you are finished designing the filter, you may click the **Finish** button to save the filter and return to the **Track Attribute Filters** tab. If a name is not specified for the filter, the filter will be called Filter. If there is already a filter called Filter, it will be called Filter1, etc.
To continue designing the filter, click the **Next** button to display the **Track Attribute Filter Wizard** 2 of 4 window (Figure 188).
The **Track Attribute Filter Wizard** 2 of 4 window (Figure 188) allows you to further filter the track types you have selected by their attributes. Click the **If** button to activate the **Attribute** field.

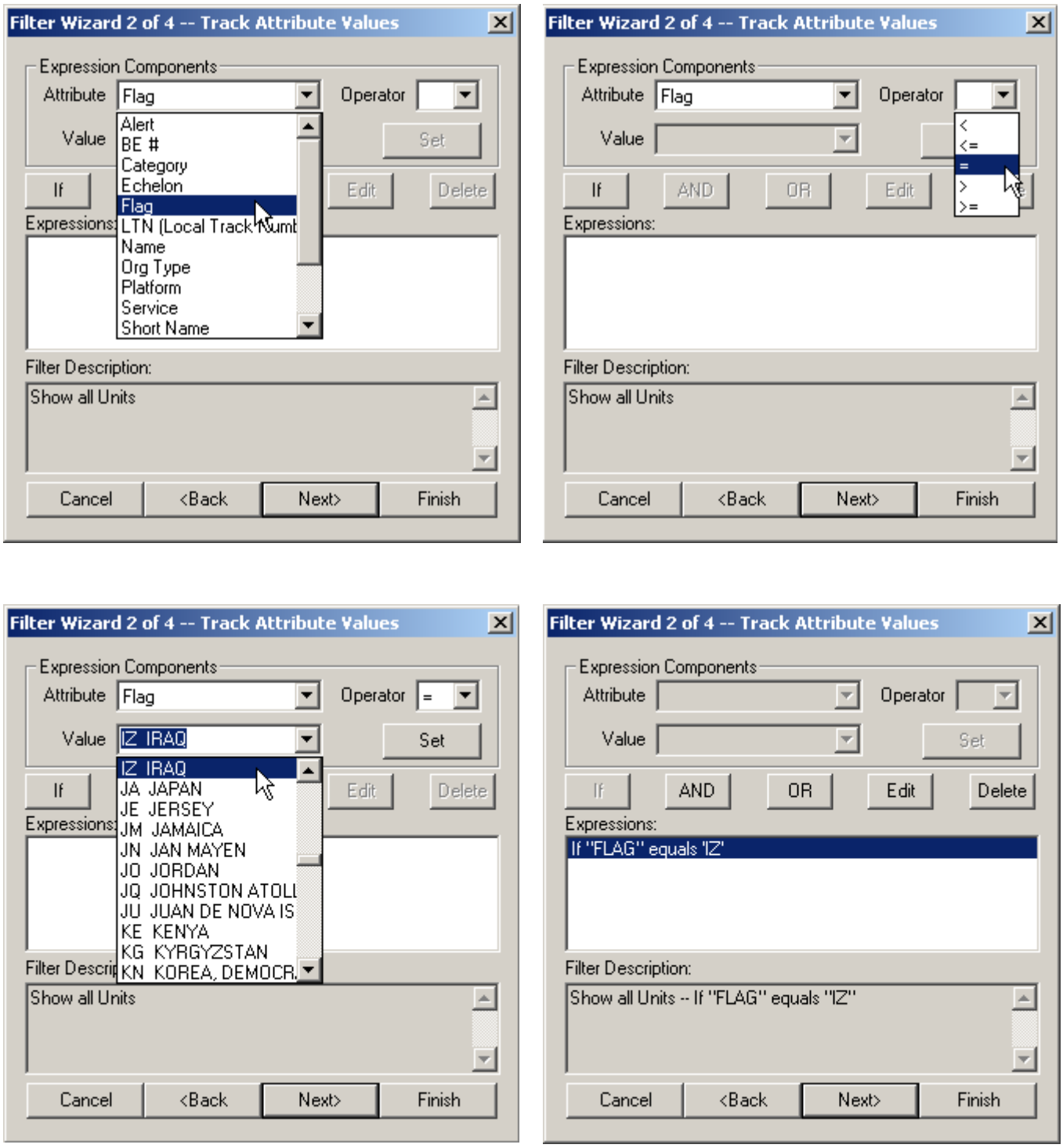


Figure 188. Filter Creation Wizard (building the track attributes filter expression)

When at least one expression is set, the **If** button becomes inactive, and the **AND**, **OR**, **Edit**, and **Delete** buttons become active.

Use the **AND** button to add an additional expression to the filter that must also be true for the filter to take effect. After clicking the **AND** button, the **Attribute** field becomes active. Enter another expression into the fields as described above.
Use the **OR** button to add an additional expression to the filter that can be true instead of the previous expression for the filter to take effect. After clicking the **OR** button, the **Attribute** field becomes active. Enter another expression into the fields as described above. When a combination of **AND** and **OR** expressions are part of a filter, the **AND** statements will be evaluated first, followed by the **OR** statements. For example, if there are two **AND** statements followed by an **OR** statement in a filter, both **AND** statements must be true or the **OR** statement must be true for the filter to take effect. Instead of constructing complicated **AND/OR** combinations for a filter, multiple simpler filters can be constructed to achieve the same results.
To edit an existing expression, select the expression in the **Expressions** box and click the **Edit** button. All of the fields in the **Expression Components** box become active. Modify any of the fields as appropriate and click the Set button to change the expression.
To delete an existing expression, select the expression in the **Expressions** box and click the **Delete** button. The selected expression is immediately deleted.
After all expressions have been entered as you appropriate, click the **Next** button to display the **Position Reports Values Wizard** 3 of 4 window (Figure 189).

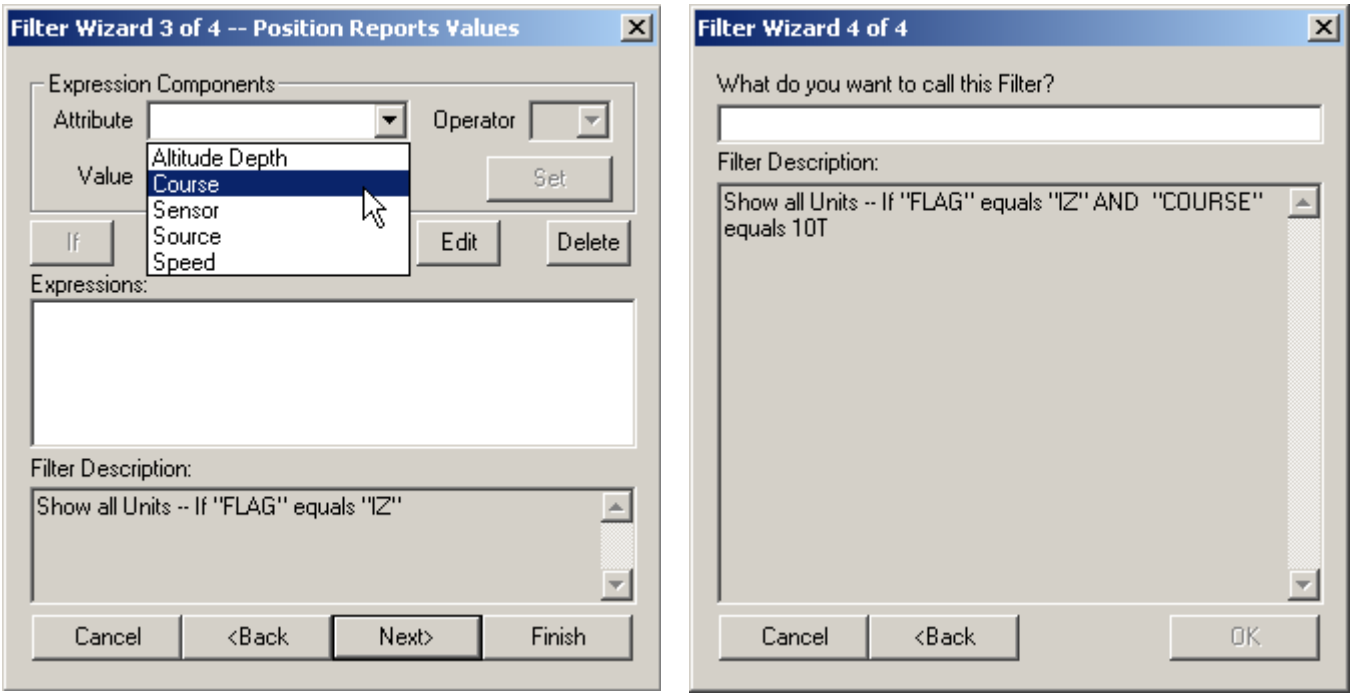


Figure 189. Filter Creation Wizard (building the position reports filter expression)

The **Position Reports Values Wizard** 3 of 4 window (Figure 189) allows you to further filter the track types you have selected by their position reports values. Click the **If**, **AND**, or **OR** button to activate the **Attribute field**.
Enter a name for the filter in the field at the top of the window. The complete filter description is shown in the **Filter Description** box. Click the **OK** button to save the filter and return to the **Track Attribute Filters** tab.

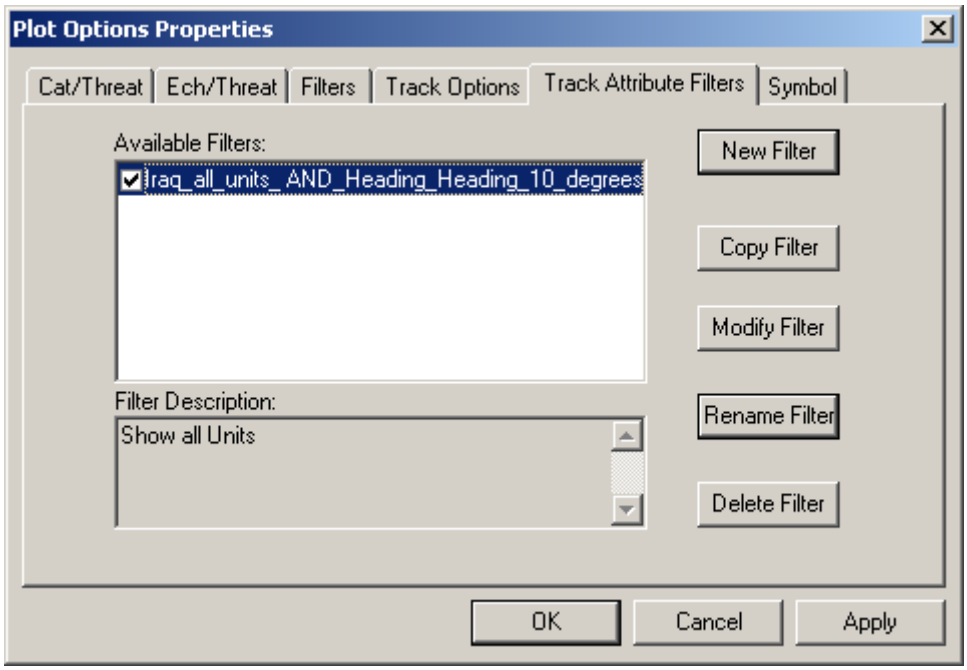


Figure 190. Newly filter created and selected

6. Symbol

The **Symbol** tab (Figure 191) allows you to display additional symbol features. The **Symbol** tab displays checkboxes for many items associated with units. These checkboxes only have an effect if you are in **MIL-STD-2525** symbol mode. If in **NTDS** mode, the unit name will be displayed next to the symbol, but no other items can be plotted.
This functionality is exactly that same one as for Overlays, which is covered in **Chapter V Using C2PC**, **subsection A.3.e Symbol**.

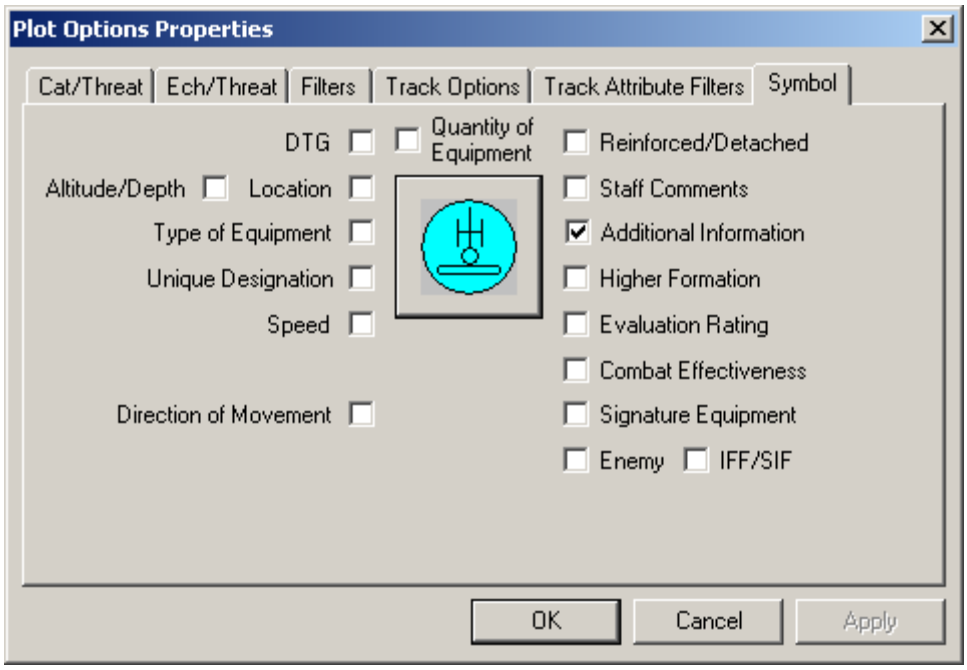


Figure 191. Symbol Tab

Appendix A. Default Vehicle Types and Mobility Parameters.

This appendix is a partial listing of the types of vehicles that fit the ARM1, ARM 2, and WHL mobility parameters.

1. **ARM 1**: Highly mobile armored vehicles:

    - M1, M1A1 Abrams
    - M2, M2A1, M2A2, M2A3 Bradley Fighting Vehicle
    - M3, M3A1, M3A2 Cavalry Fighting Vehicle
    - T-72, T-72M, and Chinese T-72 derivatives (Tank); T-80 Tank ; T-90 Tank
    - BMP-3 (Infantry Fighting Vehicle), and derivatives
    - Challenger (Tank)
    - Crusader howitzer

2. **ARM 2**: Moderately mobile armored vehicles

    - M60A3 tank
    - M113 Armored Personnel Carrier
    - M109-series howitzers
    - T-62 tank; T-54/55 tank; T-34 Tank
    - BMP-1, BMP-2, and Chinese derivatives
    - MTLB
    - M-47/M-48 tank
    - 2S1, 2S3, 2S5, 2S7, 2S9 howitzers
    - LVTP/AAV-7

3. **WHL**: Wheeled combat vehicles

    - LAV
    - BTR-60, BTR-70, BTR-80, BTR-90
    - BRDM

- HMMWV

United States Marine Corps
MAGTF Staff Training Program
2084 South Street
Quantico, VA 22134-5001

MSTP Web site:

www.mstp.usmc.mil

VIII. C2PC and Situational Awareness

A. Customizing the View by Using Filters

Use this option to determine the way tracks plot in the map window. Tracks can be set to automatically appear or not based on some of their attributes. The size of track symbols can be set to appear larger or smaller.

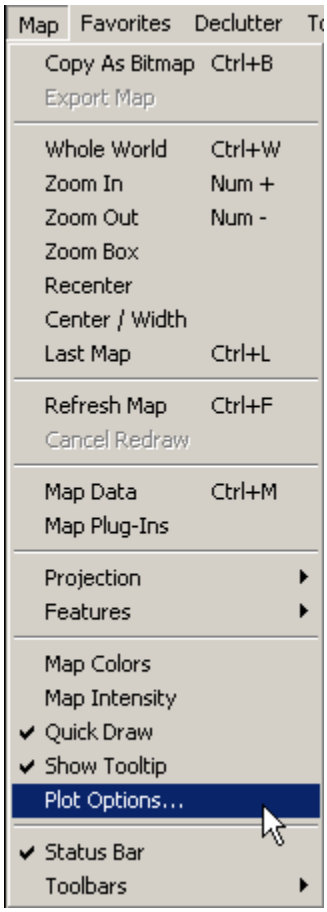
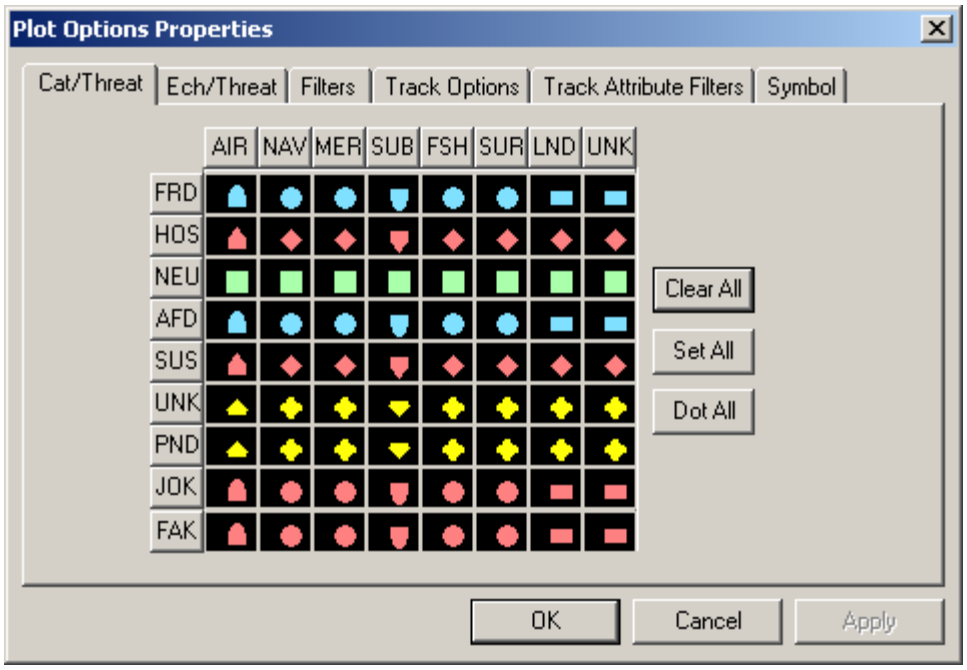


Figure 181. Using Plot Options to customize the C2PC view

Choose **Plot Options** (Figure 181) to display the **Plot Options Properties** window (Figure 182).

The Plot Options Properties window contains six separate folders - Cat/Threat, Ech/Threat, Filters, Track Options, Track Attribute Filters, and Symbol. Click on one of these tabs to view the plot settings available in that folder.



NOTE: these display options do not affect tracks which are part of a track group.

Figure 182. Plot Options Properties window

1. Cat/Threat

The **Cat/Threat** tab (Figure 182) allows you to use track category and track threat to determine which tracks to display. This view is the default view after selecting **Plot Options**.

The display choices are to display the track symbol, display the track as a dot, or turn off display of the track. Use the **Track Category** buttons across the top and the Threat buttons on the left to specify the type of tracks you want displayed. Click a **Track Category** button to toggle a column of selections, click a **Threat** button to toggle a row of selections, or click an individual checkbox to toggle an individual selection. Clicking a row, column or individual selection toggles the selection between display on, display as dot, and do not display.

Click the **Clear All** button to toggle all checkboxes off. Click the **Set All** button to toggle all checkboxes on. Click the **Dot All** button to change all the track symbols to dots.

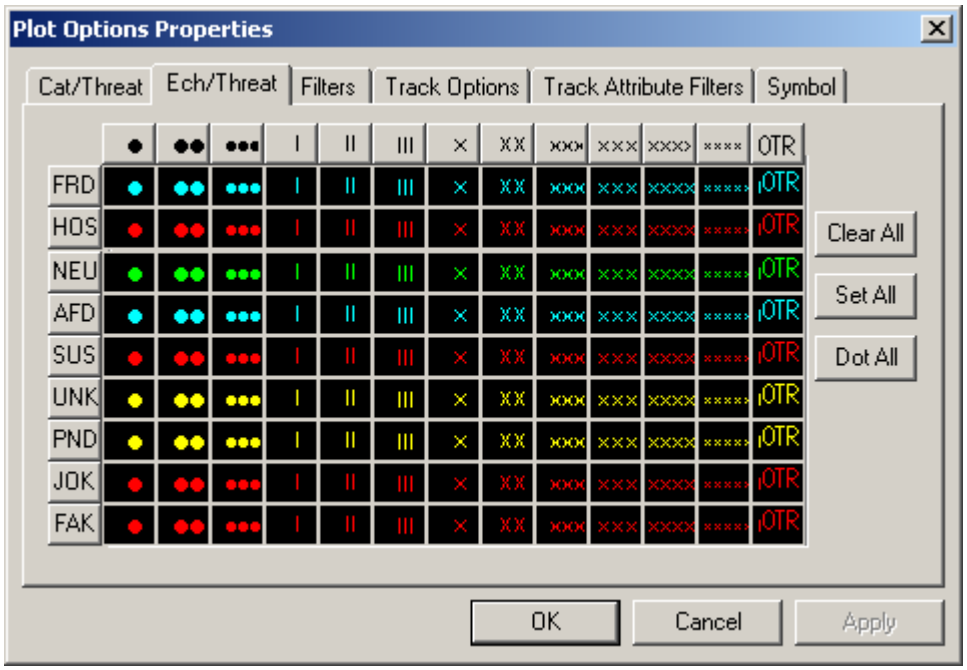
Click the **Apply** button to accept any changes to the checkbox settings and remain in the **Plot Options Properties** window. Any changes made to the checkboxes are reflected in the display of tracks in the map window and to tracks in the track list.

Click the **OK** button to accept any changes to the checkbox settings and exit the Plot Options Properties window.

Click the **Cancel** button to discard all changes made since the last time the **Apply** button was clicked and exit the **Plot Options Properties** window.

2. Ech/Threat

The Ech/Threat tab (Figure 183) allows you to use echelon level and track threat to determine which tracks to display.



NOTE: these display options do not affect tracks which are part of a track group.

Figure 183. Ech/Treat Tab

Use the **Echelon** buttons across the top and the **Threat** buttons on the left to specify the type of tracks you want displayed. Click an **Echelon** button to toggle a column of selections, click a **Threat** button to toggle a row of selections, or click an individual checkbox to toggle an individual selection. Clicking a row, column or individual selection toggles the selection between display on, display as dot, and do not display.

Click the **Clear All** button to toggle all checkboxes off. Click the **Set All** button to toggle all checkboxes on. Click the **Dot All** button to change all the symbols to dots.

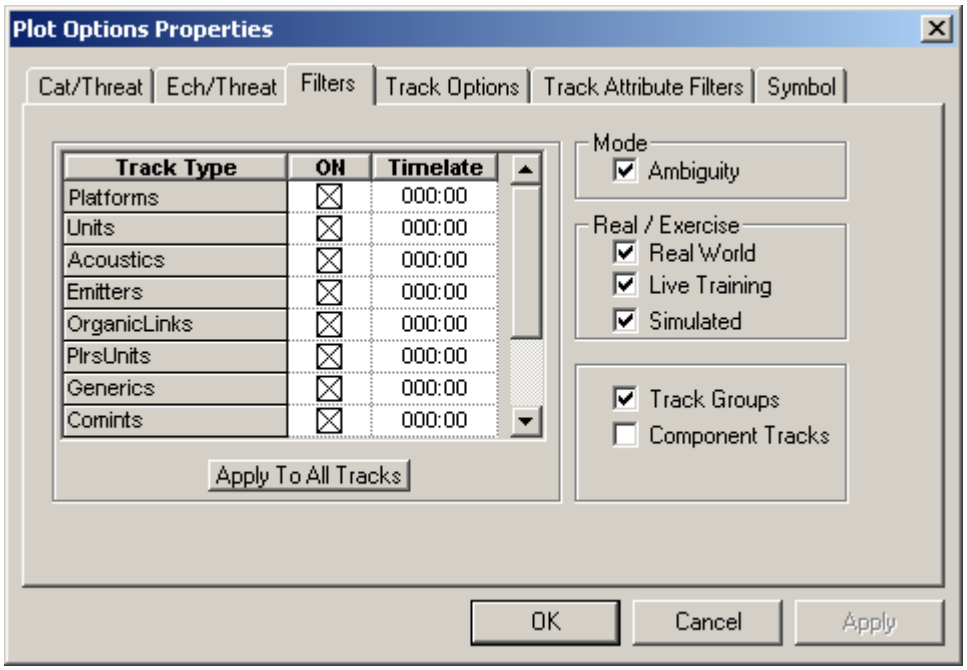
Click the **Apply** button to accept any changes to the checkbox settings and remain in the **Plot Options Properties** window. Any changes made to the checkboxes are reflected in the display of tracks in the map window and in the track list.

Click the **OK** button to accept any changes to the checkbox settings and exit the **Plot Options Properties** window.

Click the **Cancel** button to discard all changes made since the last time the **Apply** button was clicked and exit the **Plot Options Properties** window.

3. Filters

The **Filters** tab (Figure 184) contains groups of checkboxes which allow you to turn on or off certain categories of tracks and track display features.



NOTE: Click the ON checkboxes in the Track Types box to select track types for display.

Figure 184. Filters Tab

A check mark in a box turns the category ON. There are a total of four areas in this tab. For any of the track types, a timelate can be entered in the **Timelate** column. To enter a timelate, enter the number of hours (0-999). If greater than zero, only those tracks with a timelate lower than this number will be displayed. If zero is entered, tracks will display regardless of the DTG of their last report.

For either the **ON** or the **Timelate** column, you may use the **Apply To All Tracks** button to apply the last setting entered to all the track types. For example, if you click a the Units ON checkbox to off, then clicking the Apply To All Tracks button would change all the checkboxes in the ON column to off. Example 2: If you set the Platforms Timelate to 002:00, then click the Apply To All Tracks button, all the Timelates are changed to 002:00.

Click on the **Ambiguity** checkbox to display ambiguous tracks. Ambiguous tracks are those tracks that don't correlate with any existing tracks and that don't contain enough information to be classified as a new track.

Click the **Apply** button to accept any changes to the settings and remain in the **Plot Options Properties** window. Any changes are reflected in the display of tracks in the map window and in the track list.

Click the **OK** button to accept any changes to the checkbox settings and exit the **Plot Options Properties** window.
Click the **Cancel** button to discard all changes made since the last time the Apply button was clicked and exit the **Plot Options Properties** window.

4. Track Options

The **Track Options** tab (Figure 185) allows you to set track label features, AOU on/off, and range circle on/off on a track type basis.
The **Label** column displays the label type that appears for tracks of the chosen track type in the map window. To change the label type for a particular track type, click the appropriate label cell to display a down arrow in the cell. Click the down arrow to display all the available label type choices and choose the label type you want from the list.

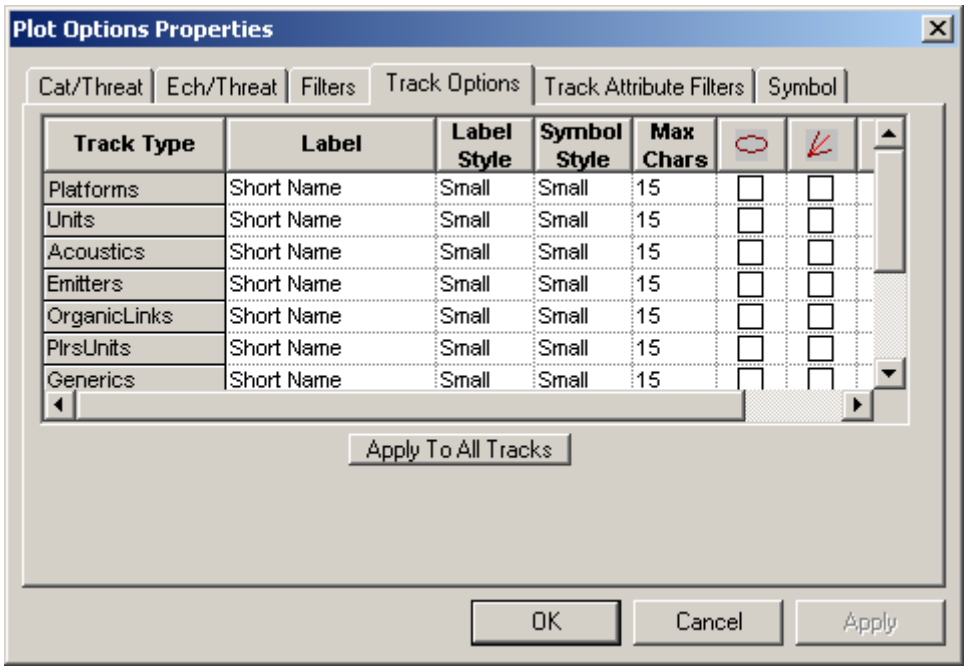


Figure 185. Tack Options Tab

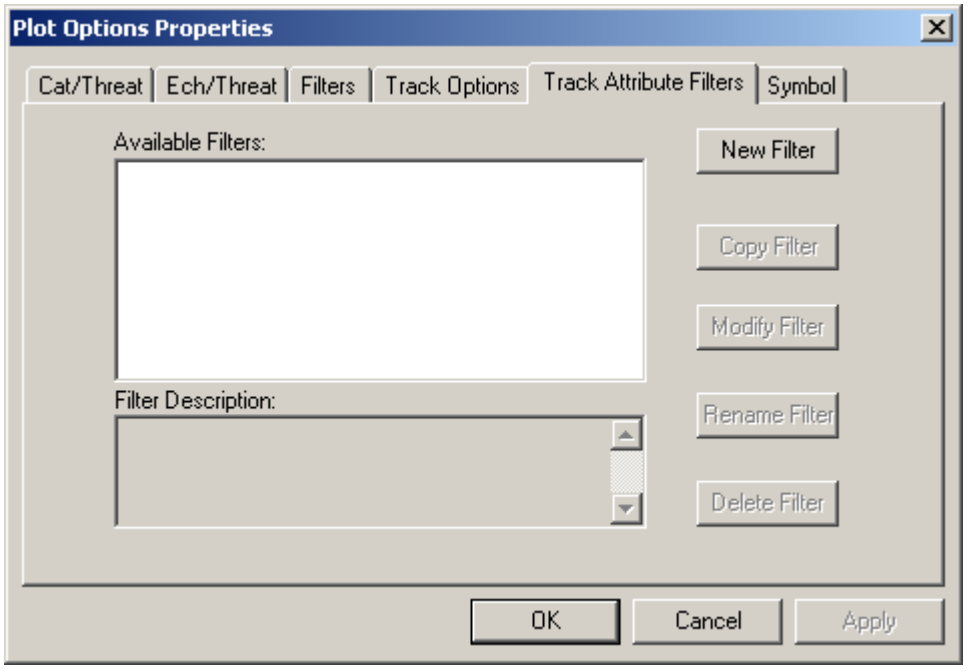
The **Label Style** column displays the label style that appears for tracks of the chosen track type in the map window. To change the label style for a particular track type, click the appropriate label style cell to display a down arrow in the cell. Click the down arrow to display all the available label style choices and choose the label style you want from the list.
The **Symbol Style** column displays the symbol style that appears for tracks of the chosen track type in the map window. To change the symbol style for a particular track type, click the appropriate symbol style cell to display a down arrow in the cell. Click the down arrow to display all the available symbol style choices and choose the symbol style you want from the list.
The **Max Chars** column displays the maximum number of characters that will display for the track labels of tracks of the chosen track type in the map window. To change the maximum number of characters, click the appropriate cell to display a down arrow in the cell. Click the down arrow to display all the available choices and choose the number you want from the list.

Click the **Apply** button to accept any changes to the values in the **Track Options** tab and remain in the **Plot Options Properties** window. Any changes made are reflected in the display of tracks in the map window and in the track list.

Click the **OK** button to accept any changes to the settings and exit the Plot Options Properties window.
Click the **Cancel** button to discard all changes made since the last time the **Apply** button was clicked and exit the **Plot Options Properties** window.

5. Track Attribute Filters

The **Track Attribute Filters** tab allows you to set filters for specific track types and their attributes. You will be building these filters to customize even more your view.



NOTE: With the Track Attribute Filter tab you can create your own filters to help you to customize your view even further.

Figure 186. Track Attribute Filters Tab

The **Available Filters** box displays a list of filters that have already been set. If the checkbox for a filter is turned on, that filter is active. If the checkbox is turned off, the filter is inactive. Select a filter from the **Available Filters** box to display a description of the filter in the **Filter Description** box.
To set a new filter, click the **New Filter** button (Figure 186) to display the **Track Attribute Filter Wizard** 1 of 4 window (Figure 187).

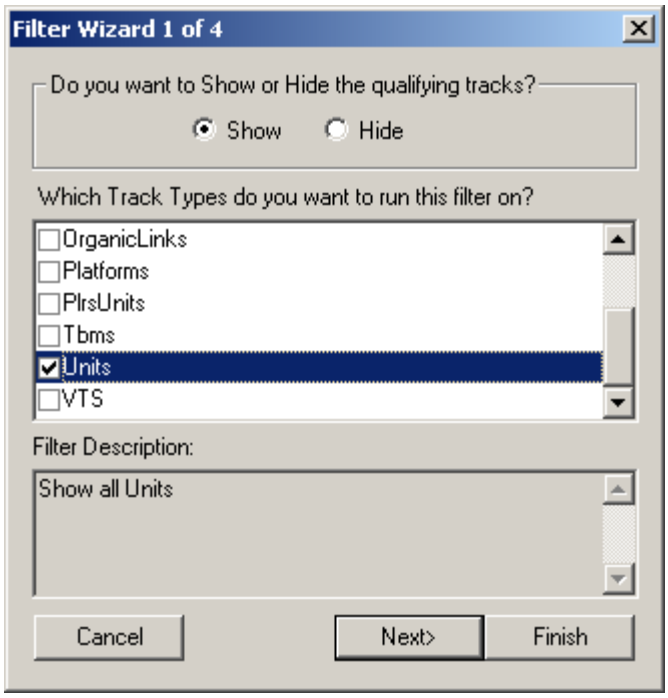


Figure 187. Filter Creation Wizard (type of tracks)

On the **Track Attribute Filter Wizard** (Figure 187), click on the checkboxes for the track types you wish to filter and click either the **Show** or **Hide** button to specify whether those tracks should be shown or hidden with this filter.
When at least one track type is chosen, the **Next** and **Finish** buttons become active. If you are finished designing the filter, you may click the **Finish** button to save the filter and return to the **Track Attribute Filters** tab. If a name is not specified for the filter, the filter will be called Filter. If there is already a filter called Filter, it will be called Filter1, etc.
To continue designing the filter, click the **Next** button to display the **Track Attribute Filter Wizard** 2 of 4 window (Figure 188).
The **Track Attribute Filter Wizard** 2 of 4 window (Figure 188) allows you to further filter the track types you have selected by their attributes. Click the **If** button to activate the **Attribute** field.

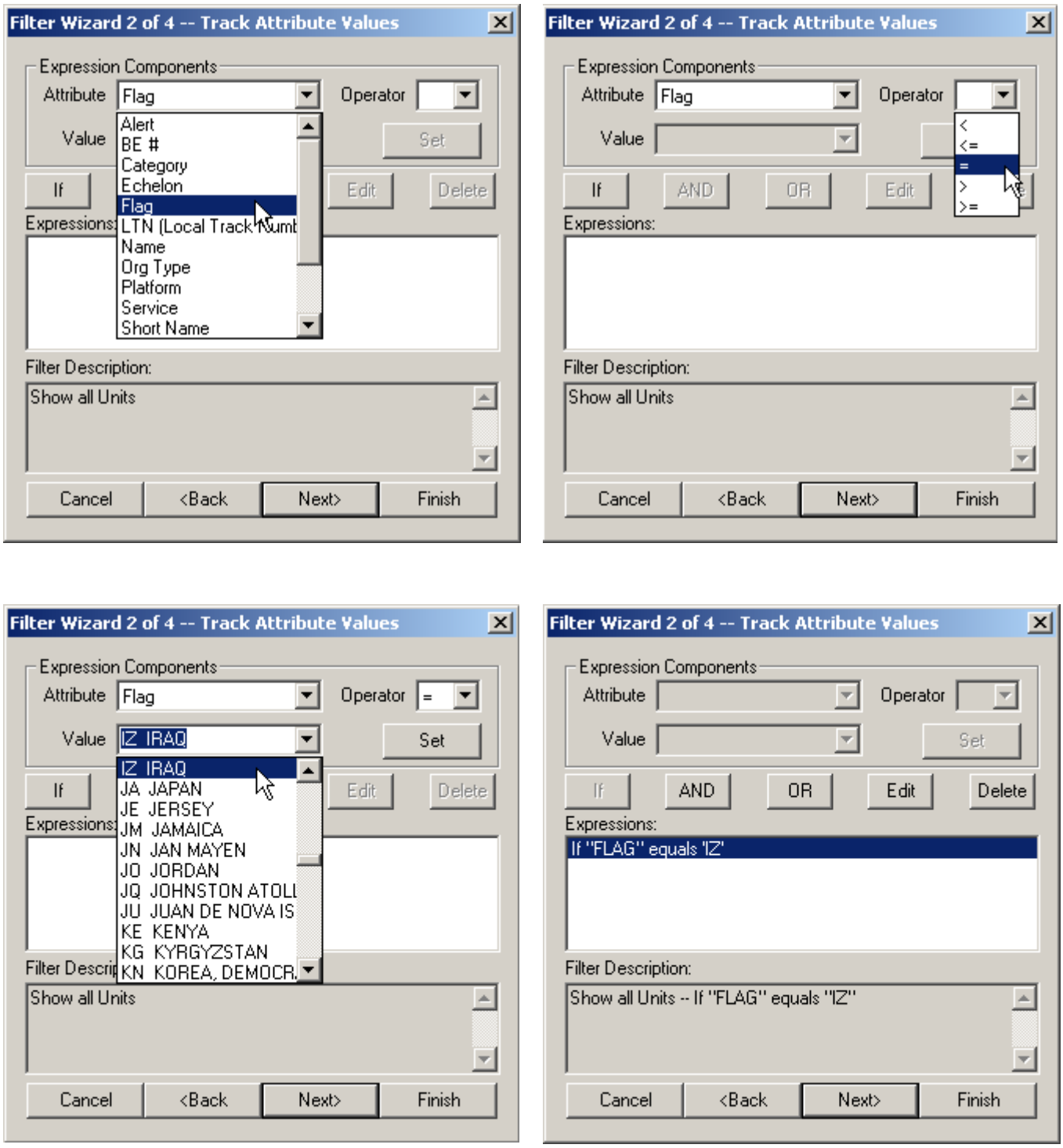
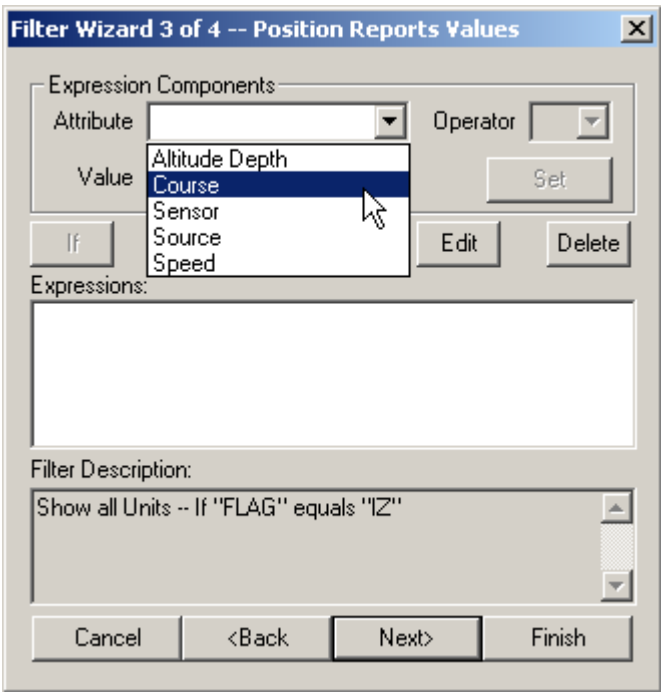


Figure 188. Filter Creation Wizard (building the track attributes filter expression)

When at least one expression is set, the **If** button becomes inactive, and the **AND**, **OR**, **Edit**, and **Delete** buttons become active.

Use the **AND** button to add an additional expression to the filter that must also be true for the filter to take effect. After clicking the **AND** button, the **Attribute** field becomes active. Enter another expression into the fields as described above.
Use the **OR** button to add an additional expression to the filter that can be true instead of the previous expression for the filter to take effect. After clicking the **OR** button, the **Attribute** field becomes active. Enter another expression into the fields as described above. When a combination of **AND** and **OR** expressions are part of a filter, the **AND** statements will be evaluated first, followed by the **OR** statements. For example, if there are two **AND** statements followed by an **OR** statement in a filter, both **AND** statements must be true or the **OR** statement must be true for the filter to take effect. Instead of constructing complicated **AND/OR** combinations for a filter, multiple simpler filters can be constructed to achieve the same results.
To edit an existing expression, select the expression in the **Expressions** box and click the **Edit** button. All of the fields in the **Expression Components** box become active. Modify any of the fields as appropriate and click the Set button to change the expression.
To delete an existing expression, select the expression in the **Expressions** box and click the **Delete** button. The selected expression is immediately deleted.
After all expressions have been entered as you appropriate, click the **Next** button to display the **Position Reports Values Wizard** 3 of 4 window (Figure 189).
The **Position Reports Values Wizard** 3 of 4 window (Figure 189) allows you to further filter the track types you have selected by their position reports values. Click the **If**, **AND**, or **OR** button to activate the **Attribute field**.
Enter a name for the filter in the field at the top of the window. The complete filter description is shown in the **Filter Description** box. Click the **OK** button to save the filter and return to the **Track Attribute Filters** tab.



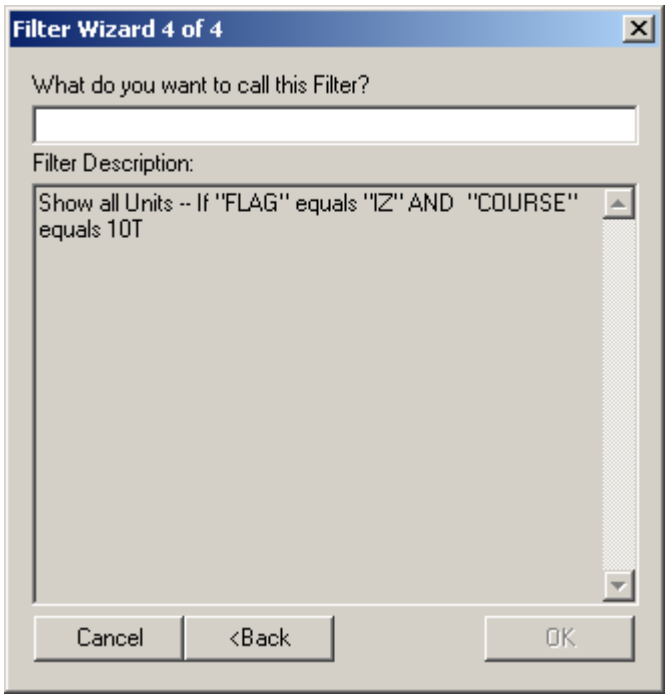


Figure 189. Filter Creation Wizard (building the position reports filter expression)

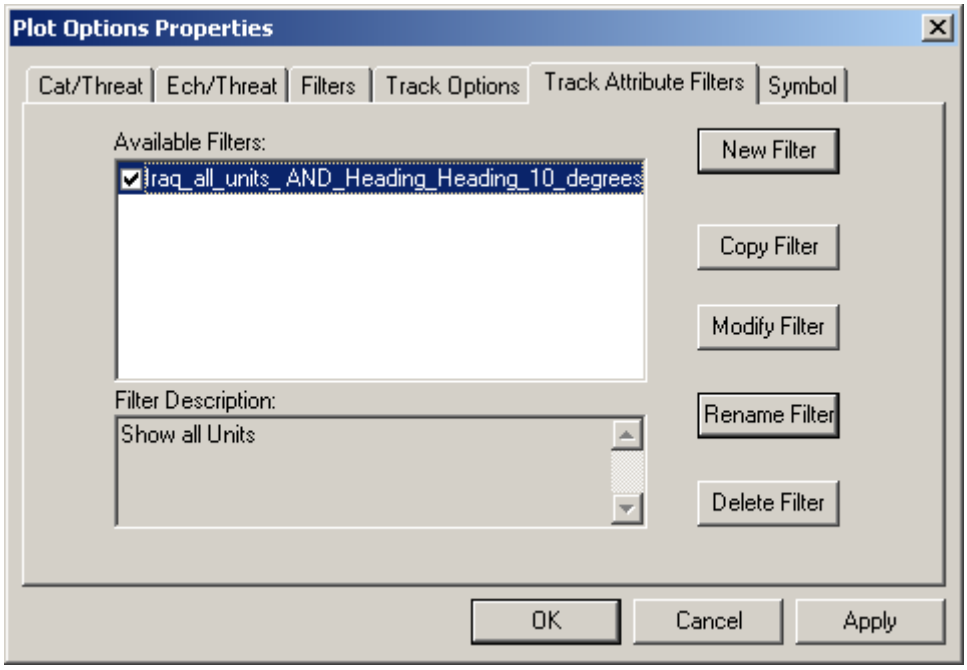


Figure 190. Newly filter created and selected

6. Symbol

The **Symbol** tab (Figure 191) allows you to display additional symbol features. The **Symbol** tab displays checkboxes for many items associated with units. These checkboxes only have an effect if you are in **MIL-STD-2525** symbol mode. If in **NTDS** mode, the unit name will be displayed next to the symbol, but no other items can be plotted.

This functionality is exactly that same one as for Overlays, which is covered in **Chapter V Using C2PC**, **subsection A.3.e Symbol**.

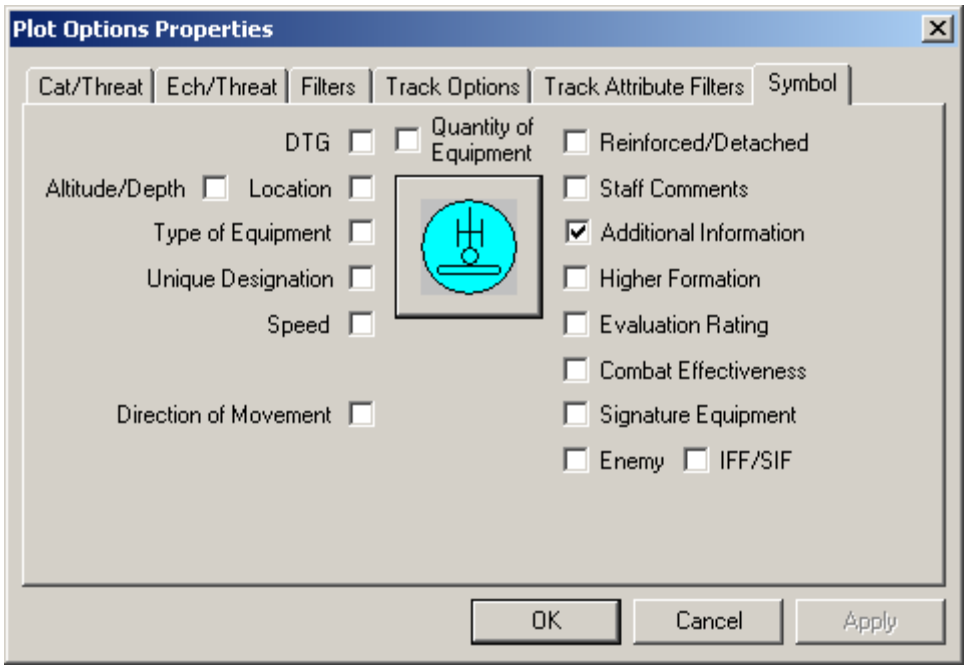


Figure 191. Symbol Tab

Appendix A. Default Vehicle Types and Mobility Parameters.

This appendix is a partial listing of the types of vehicles that fit the ARM1, ARM 2, and WHL mobility parameters.

1. **ARM 1**: Highly mobile armored vehicles:

    - M1, M1A1 Abrams
    - M2, M2A1, M2A2, M2A3 Bradley Fighting Vehicle
    - M3, M3A1, M3A2 Cavalry Fighting Vehicle
    - T-72, T-72M, and Chinese T-72 derivatives (Tank); T-80 Tank ; T-90 Tank
    - BMP-3 (Infantry Fighting Vehicle), and derivatives
    - Challenger (Tank)
    - Crusader howitzer

2. **ARM 2**: Moderately mobile armored vehicles

    - M60A3 tank
    - M113 Armored Personnel Carrier
    - M109-series howitzers
    - T-62 tank; T-54/55 tank; T-34 Tank
    - BMP-1, BMP-2, and Chinese derivatives
    - MTLB
    - M-47/M-48 tank
    - 2S1, 2S3, 2S5, 2S7, 2S9 howitzers
    - LVTP/AAV-7

3. **WHL**: Wheeled combat vehicles

    - LAV
    - BTR-60, BTR-70, BTR-80, BTR-90
    - BRDM

- HMMWV

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